Technology Transfer
Commercializing Discoveries at Research Centers Through Linked Innovation
TO ALL MANAGING DIRECTORS AND ACADEMIC LEADERS AT RESEARCH CENTERS WHO POSITIVELY IMPACT SOCIETIES AND ECONOMIES THROUGH THEIR WORK
HOW TO PASS FROM BROKEN INNOVATION TO LINKED INNOVATION?

WE WILL SHOW YOU:

- 19 MECHANISMS
- 12 BUSINESS MODELS
- FOR GROWTH IN RESEARCH CENTERS

BASED ON THE ANALYSIS OF:

- 3,881 RESEARCH CENTERS
- SUCCESSFUL RESEARCH CENTERS IN: University, Industry, Government
- 107 COUNTRIES
- 54 ON-SITE VISITS
- 61 INTERVIEWS WITH LEADERS

The **unconnected process** between research and commercialization, a route in which the investigation undertaken is not transformed into economic value to make the process sustainable.

The **connected process** between research and commercialization, a route in which the investigation done is transformed into economic value to make the process sustainable.
UNDERSTANDING THE DIFFERENCES

LINKED INNOVATION

PULL RESEARCH

PUSH RESEARCH

PUSH COMMERCIALIZATION

BROKEN INNOVATION

PULL RESEARCH

PUSH COMMERCIALIZATION

LACK OF CONNECTION

CONNECTION

COMMERCIALIZATION

INNOVATION ECOSYSTEM

STAGE 1

STAGE 2

STAGE 3

RESEARCH Discovery

TRANFORMATION Invention

COMMERCIALIZATION Innovation

STAGE

ACTIVITIES & OUTPUT

translate into

translate into
THE STAGES OF INNOVATION

STAGE 1: RESEARCH
Discovery
- Knowledge assets: Intangible and high adaptable (e.g., gas)

STAGE 2: TRANSFORMATION
Invention
- Tangible assets, still adaptable (e.g., liquid)

STAGE 3: COMMERCIALIZATION
Innovation
- Commercial assets: Adaptable and tangible (e.g., solid)

AREAS OF CHALLENGES

PERFORMANCE METRICS

MARKET UNDERSTANDING

INDUSTRY COLLABORATION

CAUSES OF FAILURE

4 CAUSES OF FAILURE TO SELECT APPROPRIATE RESEARCH INITIATIVES

1. Non holistic prioritization
2. Lack of knowledge sharing
3. Lack of non academic experience
4. Lack of academic experience

4 CAUSES OF FAILURE TO TRANSLATE DISCOVERIES INTO INVENTIONS

5. Ignorance of market needs
6. Lack of business vision
7. Teams lacking academic or executive profiles
8. Uncoachable researchers

8 CAUSES OF FAILURE TO ACHIEVE INDUSTRY COLLABORATIONS

9. Unclear business model
10. Lack of brand
11. Lack of experienced research team
12. Unclear value proposition
13. Disproportional research team
14. Internal politics and bureaucracy
15. Nonacceptance of generated research results
16. Lack of public funding

MECHANISMS TO TACKLE DIFFICULTIES

1. Prioritize research with holistic KPIs
2. Map researchers’ interests
3. Attract an advisory board
4. Use professional recruitment
5. Map market needs
6. Follow lean research principles
7. Mix PhDs and MBA teams
8. Measure the ability to be coachable
9. Design a collaborative business model
10. Align center’s age and orientation
11. Partner with recognized professors
12. Lecture translating research into impact
13. Adapt team’s size
14. Map decision makers and their KPIs
15. Pre-sell your solution
16. Build a unit for raising public funds
THE DILEMMA: ACADEMIC QUALITY OR ECONOMIC SUSTAINABILITY

HOW TO ACHIEVE ECONOMIC SUSTAINABILITY WHILE PRESERVING ACADEMIC QUALITY?

This was the most common answer given by leaders of research centers when asked to identify their top challenge, according to interviews with:

- 61 LEADERS
- at 35 INTERNATIONAL RESEARCH CENTERS
- 28 ON-SITE VISITS

Achieve a research center that is financially sustainable

RESEARCH QUALITY

PRIORITIZES: academic metrics
FOCUS: preserving the quality
RESULT: low levels of revenues to sustain the center economically

Research centers’ academic directors

PARADOX

2 STREAMS OF THOUGHT REGARDING THIS PARADOX

There is not only an opposition of thought but also a:

ECONOMIC SUSTAINABILITY

PRIORITIZES: economic metrics
FOCUS: ensuring economic sustainability
RESULT: the quality of the research may decline

Research centers’ executive directors

KNOWLEDGE ● GAP ● FUNDING

THE FAILURE IS THE CONTINUING ASSUMPTION THAT RESEARCH CENTERS SHOULD CHOOSE BETWEEN ACADEMIC RIGOR AND ECONOMIC PROFITABILITY

FOCUS:

- preserving the quality

PRIORITIZES:

- academic metrics

RESULT:

- low levels of revenues to sustain the center economically
INNOVATION FUNNEL

STAGE 1

RESEARCH
Discovery
Knowledge assets. Intangible and highly adaptable (e.g., gas)

TRANSFORMATION
Invention
Tangible assets, still adaptable (e.g., liquid)

COMMERCIALIZATION
Innovation
Commercial assets. Adaptable and tangible (e.g., solid)

STAGE 2

STAGE 3

AREAS OF CHALLENGES

PERFORMANCE METRICS
How to choose from different initiatives in the research stage

MARKET UNDERSTANDING
Principles for understanding the market and successfully transforming discoveries into products and services

INDUSTRY COLLABORATION
Mechanisms to commercialize discoveries effectively

ACTIVITIES & OUTPUT

6 SYMPTOMS TO IDENTIFY BROKEN INNOVATION

ECONOMIC VS. ACADEMIC
1 Are you experiencing a decline in research quality?
2 Are you facing a decrease in economic profitability?

ASSUMING VS. FOLLOWING
3 Are you coming up with products or services that no one wants to buy?
4 Are you producing outdated products?

RESEARCH VS. FURTIVE
5 Are you experiencing increased difficulty in monetizing your discoveries?
6 Are you experiencing increased difficulty in getting access to industry data and professional networks?

STAGE

3,000 RAW IDEAS

300 IDEAS

125 SMALL PROJECTS

9 SIGNIFICANT PROJECTS

4 DEVELOPMENT EFFORT

1.7 COMMERCIALLY LAUNCH

1 COMMERCIALLY SUCCESSFUL
I KNOW I HAVE A BROKEN INNOVATION PROCESS, AND NOW?

HOW CAN I SOLVE THE LACK OF CONNECTION?
Perceived demand will be met only if the appropriate knowledge or technology is available, and innovation will be realized only if there is a market for it.

TWO VARIABLES
These will help you to identify what challenges are more common in research centers like yours.

WHERE ARE YOU?

Two aspects interconnected:
PUSH OF KNOWLEDGE
PULL OF MARKET NEEDS

AGE
YOUNG: Research centers that have been created within the last 7 years
MATURE: Research centers that have been created more than 7 years ago

ORIENTATION
RESEARCH: Answering theoretical questions (e.g., centers in university)
INNOVATION: Answering more practitioner-oriented questions (e.g., centers in industry)
STAGE 1
RESEARCH
STAGE 1
RESEARCH

2 SYMPTOMS OF BROKEN INNOVATION

1. ARE YOU EXPERIENCING A DECLINE IN A RESEARCH QUALITY?
2. ARE YOU FACING A DECREASE IN ECONOMIC PROFITABILITY?

ADMINISTRATORS
Prioritizes: Economic metrics
What they want?
• Be economically sustainable to support research activities
• Provide outreach and make research results visible

RESEARCHERS
Prioritizes: Academic metrics
What they want?
• Greater level of research freedom
• Greater involvement in pure academic research

4 CAUSES OF FAILURE

1. NON HOLISTIC PRIORITIZATION
2. LACK OF KNOWLEDGE SHARING
3. LACK OF NONACADEMIC EXPERIENCE
3. LACK OF ACADEMIC EXPERIENCE

STAGE 1: RESEARCH
**BEST PRACTICE:**

**PRIORITIZE RESEARCH WITH HOLISTIC KPIS**

Design a holistic group of few KPIs to measure the ongoing progress of your center and align goals.

**EXAMPLE: MIT Deshpande Center**

MIT Deshpande Center uses holistic metrics in the whole organization, considering academic, economic and social impact.

**ANSWER THESE QUESTIONS TO CHECK WHETHER YOU HAVE THIS PROBLEM:**

A. Are you experiencing a decline in research quality?

B. Are you not economically sustainable or experiencing a decrease in economic profitability?

**SOLUTION TO THIS PROBLEM:**

<table>
<thead>
<tr>
<th>New projects</th>
<th>KPIs</th>
<th>IMPACT Academic</th>
<th>IMPACT Economic</th>
<th>IMPACT Social</th>
<th>VIABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACTIVITIES</strong></td>
<td></td>
<td>+ circles, + value</td>
<td>+ circles, - value</td>
<td>- circles, - value</td>
<td></td>
</tr>
<tr>
<td><strong>RESEARCH</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apply to the public funding of the institution x1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apply to the public funding of the institution x2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Start negotiations with the institution x3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>INITIATIVES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Create an open innovation competition with the institution x4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Create a conference with the institution x5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Propose a consulting project about x1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**HELPS TO:**

Align both sides (academic rigor + economic value) to an integrated vision.

**IMPORTANT LESSON FOR CENTERS:**

Align academic rigor and economic value to an integrated vision.
LACK OF KNOWLEDGE SHARING

ANSWER THESE QUESTIONS TO CHECK WHETHER YOU HAVE THIS PROBLEM:

A. Do you know what your research teams are investing time in?
B. Do your researchers know what the center’s other researchers are doing?
C. Are you sure that there is no duplication among your center’s research projects?

BEST PRACTICE:

MAP RESEARCHERS’ INTERESTS

Identifying and connecting the focus of researchers in a research map, which illustrates on a single page the interests of each researcher and of the center.

SOLUTION TO THIS PROBLEM:

<table>
<thead>
<tr>
<th>Interest vs. professor</th>
<th>Professor/researcher</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Alliances / Joint ventures</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Behavioral finance</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Corporate entrepreneurship</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Corporate governance/finance/financial analysis</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Electronic market</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Entrepreneurial finance</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Innovation</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>International business/globalization</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

EXAMPLE: Roche

Hoffmann - La Roche uses a knowledge map - a directory that points people who need knowledge to the places where it can be found.

It has three parts. Firstly, the question that must be answered (e.g., to receive drug approval). Secondly, each question points to experts with knowledge in those areas. Thirdly, there are a set of guidelines that instruct knowledge providers as to when and with whom they should be sharing their knowledge. Lastly, a best-practice repository.

HELPS TO:

- Identify synergies between research projects
- Reduce the cost of duplication
- Improve the assignment of project needs to research interests
- Recognize collaborations with non-academic units
- Improve the research strategy at the center level
- Increase networking opportunities among researchers within the institution

IMPORTANT LESSON FOR CENTERS:

Hoffmann - La Roche uses a knowledge map - a directory that points people who need knowledge to the places where it can be found.
3 LACK OF NON ACADEMIC EXPERIENCE

ANSWER THESE QUESTIONS TO CHECK WHETHER YOU HAVE THIS PROBLEM:

A. Do you lack either the academic or business expertise for your strategy?

B. Do you find it difficult to assess the potential economic impact that a project may have on the industry?

BEST PRACTICE:

ATTRACT AN ADVISORY BOARD

Attract and recruit an international advisory board

SOLUTION TO THIS PROBLEM:

ADD A GREAT TEAM OF ADVISORS TO HELP THE MISSION

Great advisors with a lot of experience and expertise complement their skills. Advisors guide to help avoid mistakes and to expand the network of investors, partners and/or clients

Some benefits of the advisory board

- Designing the research roadmap
- Ensuring sustainability planning
- Positioning the internal knowledge in the market
- Referring to partnership
- Supporting internships
- Assessing technology
- Understanding the value proposition to industry
- Preparing candidates for research in the industry
- Enhancing technical capabilities
- Assessing the market

HELPS TO:

- Have a pool of new ideas for better connection with market need
- Identify and give visibility to how those initiatives affect the external and internal ecosystem

EXAMPLE: Cornell Tech

Cornell Tech recruited a professional investor with research experience to increase the number of spin-offs from research projects and to assess built projects involving the institution’s faculty and business units

STAGE 1: RESEARCH

Some benefits of the advisory board

0% 10% 20% 30% 40% 50% 60%
4 LACK OF ACADEMIC EXPERIENCE

ANSWER THESE QUESTIONS TO CHECK WHETHER YOU HAVE THIS PROBLEM:

A Is your executive team failing to understand the preferences and mindset of the institution’s academics?

B Is it difficult for your executive team to handle academic environments?

C Has the academic rigor of your publications declined recently?

BEST PRACTICE:

USE PROFESSIONAL RECRUITMENT

Use a professional recruitment and consider splitting the leadership in two

SOLUTION TO THIS PROBLEM:

1 SPECIALIZE THE LEADERSHIP ROLE INTO TWO

 Academic Director + Executive Director

2 CONSIDER PARTNERING WITH PROFESSIONAL RECRUITMENT FIRMS

To fill a talent gap or a weakness

EXAMPLE: Knowledge Circle of Amsterdam

The Knowledge Circle of Amsterdam meets regularly to formulate and propose ideas for enhancing knowledge based development. “After hours clubs in New York City can also be considered as a consensus space, providing venues for artists, fashion designers, and other creative individuals to develop new projects across arts and fashion” research institutions

HELPS TO:

- Identify and recruit potential directors
- Increase the quality of the process, avoiding internal biases (in same cases)
- Ensure that someone will keep the academic rigor and the financial sustainability

IMPORTANT LESSON FOR CENTERS:
CONCLUSIONS
STAGE 1: RESEARCH

2 SYMPTOMS OF BROKEN INNOVATION

ARE YOU EXPERIENCING A DECLINE IN RESEARCH QUALITY?

ARE YOU FACING A DECREASE IN ECONOMIC PROFITABILITY?

4 CAUSES OF FAILURE

1. NON HOLISTIC PRIORITIZATION
   INDICATORS
   Too much emphasis to a particular criteria, either academic or economic

2. LACK OF KNOWLEDGE SHARING
   INTERCONNECTION
   Don’t know what other teams are doing. Work duplication and no synergies

3. LACK OF NON ACADEMIC EXPERIENCE
   LEADERSHIP
   Sometimes directors come from a non academic background

3. LACK OF ACADEMIC EXPERIENCE
   RIGOR
   Shortage of work already published in top academic journals

BEST PRACTICES

Prioritize research with holistic KPIs
Map researchers’ interests
Attract an advisory board
Use professional recruitment

3
2
1
STAGE 2
TRANSFORMATION
STAGE 2
TRANSFORMATION

2 SYMPTOMS OF BROKEN INNOVATION

1. **ARE YOU GETTING PRODUCTS NO ONE WANTS TO BUY?**
   - Assuming what the market needs, without validating what the market actually wants.

2. **ARE YOU GETTING OUTDATED PRODUCTS?**
   - Following exactly what the market says that it currently needs, without taking into account what the market will desire in the future.

4 CAUSES OF FAILURE

5. **IGNORANCE OF MARKET NEEDS**
6. **LACK OF BUSINESS VISION**
7. **TEAMS LACKING ACADEMIC OR EXECUTIVE PROFILES**
8. **UNCOACHABLE RESEARCHERS**
IGNORANCE OF MARKET NEEDS

ANSWER THESE QUESTIONS TO CHECK WHETHER YOU HAVE THIS PROBLEM:

A. Do you have products that no one wants to buy?
B. Do you lack market traction when you reach the commercialization stage of your discoveries?
C. Do your competitors identify market opportunities before you do?

BEST PRACTICE:

MAP MARKET NEEDS

Use a market map to identify the needs of potential partners with design thinking to increase the chances to have their interest

SOLUTION TO THIS PROBLEM:

DESIGN THINKING IS A CUSTOMER-CENTERED APPROACH

Identify customers who may use the invention
Understand and translate market needs into actionable insights
Prototyping allows researchers to make rapid iterations and subsequently adapt and learn from what does not work

RESULT:
NEEDS GATHERED

EXAMPLE: Ideo

IDEO, a global design company that creates positive impact through design and applies this concept in their research processes

HELPS TO:
Learn how researchers should explain their discoveries, gaining outside perspective

STAGE 2: TRANSFORMATION

1.1

IMPORTANT LESSON FOR CENTERS:
Research Mature
Innovation Mature
Research Young
Innovation Young
IGNORANCE OF MARKET NEEDS

ANSWER THESE QUESTIONS TO CHECK WHETHER YOU HAVE THIS PROBLEM:

A. Do you have products that no one wants to buy?
B. Do you lack market traction when you reach the commercialization stage of your discoveries?
C. Do your competitors identify market opportunities before you do?

1.1 BEST PRACTICE:

MAP MARKET NEEDS

Use a market map to identify the needs of potential partners with design thinking to increase the chances to have their interest.

INDUSTRIES

<table>
<thead>
<tr>
<th>Company 1</th>
<th>Company 2</th>
<th>Company 3</th>
<th>Company 4</th>
<th>Company 5</th>
<th>Company 6</th>
<th>Company 7</th>
<th>Company 8</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

1 MARKET MAP

2 RESEARCH MAP

TOPOGRAPHIC NEEDS

- Check databases that analyze the weaknesses of companies/sectors
- Review the strategic/annual plan of companies
- Spend time with companies’ executives in casual conversations

IDENTIFYING COMPANIES
Contact these businesses to validate the model, trying to discover their pain points

EXAMPLE: Barcelona Supercomputing Center

Barcelona Supercomputing Center constantly analyzes what are the needs of the market through a specific team, finding a fit with the research and development team.

HELPS TO:

Learn how researchers should explain their discoveries, gaining outside’s perspective
IGNORANCE OF MARKET NEEDS

ANSWER THESE QUESTIONS TO CHECK WHETHER YOU HAVE THIS PROBLEM:

A. Are the results of your research projects irrelevant to the market?
B. During research processes, do your interviewees not want to repeat the process because you take up too much of their time?
C. Do you exceed the estimated budget of your projects or increase the analysis sample to a size that does not change the conclusions?

1.2 BEST PRACTICE:

FOLLOWING LEAN RESEARCH PRINCIPLES
To maximize your learning speed and minimize your testing cost

SOLUTION TO THIS PROBLEM:

FOLLOW THE LEAN RESEARCH PRINCIPLES

TEST THE HYPOTHESES
Is important because great work is frequently achieved via quick iteration, repeating the formulation and testing of smaller hypotheses to achieve a bigger goal

If not you could invest an enormous amount of time and money in a project that might not go anywhere

HELPS TO:

Make the commercialization stage easier

EXAMPLE: MIT

MIT D-Lab
Lean research has been championed by faculty and researchers at MIT D-Lab

IMPORTANT LESSON FOR CENTERS:

LEARNING

TESTING COST

SHORT FEEDBACK LOOPS
By asking the interviewer whether they would like to include any additional thing, and after collected and analyzed pivot your prototype

FAILING QUICKLY
Allows to understand your problem and continually improve

Is important because great work is frequently achieved via quick iteration, repeating the formulation and testing of smaller hypotheses to achieve a bigger goal
LACK OF BUSINESS VISION

ANSWER THESE QUESTIONS TO CHECK WHETHER YOU HAVE THIS PROBLEM:

A. Do you have researchers who lack business knowledge or commercialization experience?
B. Does your research team invest too much time in non-academic issues?
C. How easy is it for your research team to network with the industry to gather data, invite guest speakers, and disseminate their discoveries?

BEST PRACTICE:

COMPLEMENTING KNOWLEDGE TRANSFER SERVICES

Connect individuals from:

RESEARCH DEVELOPMENT LABS
COMpanies
EDUCATIONAL INSTITUTIONS

Identify and mix the skills from the beginning

TO ACCELERATE THE PROCESS AND AVOID CONFLICTS OF INTEREST

EXAMPLE: Harvard Innovation Lab

Harvard Innovation Lab offers services to the Harvard community such as coaching through entrepreneurs in residence, investors in residence, legal partners, visiting practitioners, experts, etc.

HELPS TO:

Optimize the time invested by researchers (by leveraging complementary skills)

Create prototypes to conduct user or commercialization testing

Ensure a product-market fit prior to a formal launch

Engage with the potential market

IMPORTANT LESSON FOR CENTERS:
3 TEAMS LACKING ACADEMIC OR EXECUTIVE PROFILES

ANSWER THESE QUESTIONS TO CHECK WHETHER YOU HAVE THIS PROBLEM:

A. Are your teams formed of only academics or only non academics?
B. Do researchers and executives understand each other in terms of language, performance metrics, timing, and mindsets?

3 BEST PRACTICE:

MIXING PHDS AND MBA TEAMS

Having diverse teams of executives and academics enhances rigor and relevance

SOLUTION TO THIS PROBLEM:

DIVERSE TEAMS

Academics with PhDs + Executives with MBAs

DIVERSE BACKGROUNDS

Gender + Ethnical + Geographical

EXAMPLE: Deutsche Telekom Laboratories

During this collaboration the two partners included hybrid profiles who had a natural interest in the application of work oriented toward R&D and who understood both the academic and practitioner environments

HELPS TO:

Increase performance

Have a noticeable impact in academic research centers in translating discoveries to inventions

IMPORTANT LESSON FOR CENTERS:

Some centers incorporate “Hybrid profiles”: people with both MBA and a PhD, understand the “language”, concept and goals of both sides

Ex.: gender diverse and ethnically diverse organizations are 15 and 35% more likely, to financially outperform those that are not
UNCOACHABLE RESEARCHERS

ANSWER THESE QUESTIONS TO CHECK WHETHER YOU HAVE THIS PROBLEM:

A. Do your researchers welcome and follow your suggestions?
B. Do they follow the research center’s strategy?
C. Are they aligned with the center’s vision and mission?

BEST PRACTICE:

MEASURE THE ABILITY TO BE COACHABLE

Include the indicator “coachable” in the recruitment, evaluation, and incentive scheme of your researchers to increase the likelihood of commercialization.

EXAMPLE: Johns Hopkins University

Johns Hopkins University employs former venture capitalists. Its mission is to support the faculty as they think about, prepare, and advise on the opportunity for commercialization of Hopkins technologies.

SOLUTION TO THIS PROBLEM:

RECRUIT COACHABLE RESEARCHERS

Ensure that researchers can be coached and aligned to the strategy of the center.

SELECT WHO WILL LISTEN TO MENTOR’S SUGGESTIONS

MENTOR YOUR RESEARCHERS

Educate and guide research teams during the transformation stage, help them to progress and figure out what to do.

BE AVAILABLE TO GUIDE THE RESEARCH TEAM

HELPS TO:

Be aligned and avoid duplicity

IMPORTANT LESSON FOR CENTERS:

Include the indicator “coachable” in the recruitment, evaluation, and incentive scheme of your researchers to increase the likelihood of commercialization.
## CONCLUSIONS

**STAGE 2: TRANSFORMATION**

### 2 SYMPTOMS OF BROKEN INNOVATION

- **ARE YOU GETTING PRODUCTS NO ONE WANTS TO BUY?**
- **ARE YOU GETTING OUTDATED PRODUCTS?**

### 4 CAUSES OF FAILURE

1. **IGNORANCE OF MARKET NEEDS**
   - **INFORMATION**
     - Ineffective evaluation of the product-market fit create this misalignment

2. **LACK OF BUSINESS VISION**
   - **CONTEXT**
     - Academics specialized on research, occasionally lack knowledge in areas outside their research focus

3. **TEAMS LACKING ACADEMIC OR EXECUTIVE PROFILES**
   - **DIVERSITY**
     - Misalignments in academic needs (eg., consultant) or market priorities (eg., researchers)

4. **UNCOACHABLE RESEARCHERS**
   - **MENTORING**
     - Unaligned groups of academics grouped together

### BEST PRACTICES

- **Mapping market needs**
- **Complementing knowledge transfer services**
- **Mixing PhDs and MBA teams**
- **Measure the ability to be coachable**

- **Following lean research principles**
STAGE 3
COMMERCIALIZATION
STAGE 3
COMMERCIALIZATION

2 SYMPTOMS
OF BROKEN
INNOVATION

1
ARE YOU FINDING IT
DIFFICULT TO MONETIZE
YOUR KNOWLEDGE
ASSETS?

You are probably doing only research collaborations with industry to nurture your research

2
ARE YOU HAVING MORE
TROUBLE GETTING ACCESS
TO INDUSTRY DATA AND
NETWORKS?

You are probably seen as a furtive sales researcher

8 CAUSES
OF FAILURE

9 UNCLEAR BUSINESS MODEL
10 LACK OF BRAND
11 LACK OF EXPERIENCED RESEARCH TEAM
12 UNCLEAR VALUE PROPOSITION
13 DISPROPORTIONAL RESEARCH TEAM
14 INTERNAL POLITICS AND BUREAUCRACY
15 NON ACCEPTANCE OF GENERATED RESEARCH RESULTS
16 LACK OF PUBLIC FUNDING

STAGE 3:
COMMERCIALIZATION

8 CAUSES
OF FAILURE

9 UNCLEAR BUSINESS MODEL
10 LACK OF BRAND
11 LACK OF EXPERIENCED RESEARCH TEAM
12 UNCLEAR VALUE PROPOSITION
13 DISPROPORTIONAL RESEARCH TEAM
14 INTERNAL POLITICS AND BUREAUCRACY
15 NON ACCEPTANCE OF GENERATED RESEARCH RESULTS
16 LACK OF PUBLIC FUNDING

STAGE 3:
COMMERCIALIZATION
**UNCLEAR BUSINESS MODEL**

**BEST PRACTICE:**

**DESIGN A COLLABORATIVE BUSINESS MODEL**

Understand the possible benefits of each actor (i.e., government, industry or university). Then design a win-win collaboration that generates mutual benefit.

**SOLUTION TO THIS PROBLEM:**

**THE 12 MOST COMMON BUSINESS MODELS IDENTIFIED ARE:**

- **9.1.1 Short-term external contracting**
- **9.1.2 Medium-term external contracting**
- **9.1.3 Long-term external contracting**
- **9.1.4 Internal contracting through transfer pricing**
- **9.1.5 Freemium product/service**
- **9.1.6 Research licensing**
- **9.1.7 Technology transfer by public funding**
- **9.1.8 Creation of spin-offs**
- **9.1.9 The search model**
- **9.1.10 The consultancy joint venture**
- **9.1.11 Short-term marketing collaboration**
- **9.1.12 Long-term marketing collaboration**

**ANSWER THESE QUESTIONS TO CHECK WHETHER YOU HAVE THIS PROBLEM:**

- (A) Don’t you know how to monetize your inventions?
- (B) Are your research collaborations only a matter of gathering data?
- (C) Are you seen as a furtive research seller by other stakeholders?
- (D) Do you find it difficult to sustain long-term collaborations with industry?
STAGE 3: COMMERCIALIZATION

9 BEST PRACTICE:

DESIGN A COLLABORATIVE BUSINESS MODEL

9.1

BUSINESS MODEL

INSTITUTION

BENEFIT EXCHANGES

RESEARCH CENTER

EXCHANGES

Contract fee

Research or consultancy

Spot a problem that needs to be solved

Identify a research center that best fit the challenge

9.1.1 Short-term external contracting

AD-HOC

Contract fee

Research or consultancy

1

Spot a problem that needs to be solved

2

Identify a research center that best fit the challenge

RESEARCH CENTER

Undertake an ad-hoc research project or consultancy for a fee

In this case the research center is more involved with the corporation: strong relations with executives and gain a better understanding

1

INSTITUTION

BENEFIT EXCHANGES

RESEARCH CENTER

EXCHANGES

Provide funding, new equipment, access to data

Research capabilities

1

Spot a problem that need to be solved

2

Identify a research center that best fit the challenge

9.1.3 Long-term external contracting

SUSTAINED

RESEARCH CENTER

Undertake a sustained research project for an institution

In this case the research center is more involved with the corporation: strong relations with executives and gain a better understanding

1

INSTITUTION

BENEFIT EXCHANGES

RESEARCH CENTER

EXCHANGES

It is important to keep the research aligned with what is relevant for a client to implement

3

Spot a problem that need to be solved

Identify a research center that best fit the challenge

9.1.2 Medium-term external contracting

PLANNED

RESEARCH CENTER

Undertake a planned research project or consultancy for a fee

The company is aware in advance of the amount of projects that the research center is going to execute

3

INSTITUTION

BENEFIT EXCHANGES

RESEARCH CENTER

EXCHANGES

Every year, HP solicits ideas from academics on selected research topics. With the aim of building new research collaborations, in exchange of modest grants.

HP receives 500+ proposals per year, selecting 10% of them on the basis of its own needs

EXAMPLES:

These collaborations are done by: research centers at universities, governments and corporations such as:

- Deutsche Bank
  - Deutsche Bank Research
- The Economist Group Intelligence Unit
- Jigsaw
- A.T. Kearney Global Business Policy Council

- Banking:
- Media:
- Technology:
- Consulting:

Joint venture by Google and PwC in 2014.

The two companies agreed to share their core capabilities to bring further innovation to industry by leveraging PwC’s business insights along with Google tools and using PwC’s analytical acumen.
STAGE 3: COMMERCIALIZATION

9 UNCLEAR BUSINESS MODEL

9.1 BEST PRACTICE: DESIGN A COLLABORATIVE BUSINESS MODEL

**Examples:**

General Electric (GE) has six research centers worldwide. The centers’ internal investments in its aviation plant in Vermont have created manufacturing capabilities. A $75 million investment in the plant led to more than $300 million in engine-production savings.

Noam Wasserman, the founding director of the University of Southern California’s initiative used this model to gather data from founding teams of start-ups.

SAP traditionally followed a business model that involved receiving a licensing fee upfront for its software and then an annual fee of 17-18% of the original license fee for upgrades and maintenance.

**Name**

9.1.4 Internal contracting through transfer pricing

9.1.5 Freemium product/service

9.1.6 Research licensing

**Business Model**

**Examples:**

General Electric (GE) has six research centers worldwide. The centers’ internal investments in its aviation plant in Vermont have created manufacturing capabilities. A $75 million investment in the plant led to more than $300 million in engine-production savings.

Noam Wasserman, the founding director of the University of Southern California’s initiative used this model to gather data from founding teams of start-ups.

SAP traditionally followed a business model that involved receiving a licensing fee upfront for its software and then an annual fee of 17-18% of the original license fee for upgrades and maintenance.
UNCLEAR BUSINESS MODEL

9.1 BEST PRACTICE: DESIGN A COLLABORATIVE BUSINESS MODEL

NAME

9.1.7 Technology transfer by public funding

9.1.8 Creation of spin-offs

9.1.9 The search model

BUSINESS MODEL

EXAMPLES:

The National Aeronautics and Space Administration (NASA) has documented over 1,600 such technology transfers in its spin-off magazine since its first edition in 1976.

The government enhances the innovation level in corporations by boosting the technology transfer process in research institutions.

Cyclotron Road, launched in 2014, aims to identify and support innovators of advanced energy technology, providing them with the tools, capital, and partners needed to commercialize their technologies.

Roche incorporated an emerging role in research centers at corporations “the scouter” that connects new opportunities with business lines.

EXAMPLES:

The government enhances the innovation level in corporations by boosting the technology transfer process in research institutions.

Cyclotron Road, launched in 2014, aims to identify and support innovators of advanced energy technology, providing them with the tools, capital, and partners needed to commercialize their technologies.

Roche incorporated an emerging role in research centers at corporations “the scouter” that connects new opportunities with business lines.
9 UNCLEAR BUSINESS MODEL

9.1 BEST PRACTICE:

DESIGN A COLLABORATIVE BUSINESS MODEL

9.1.10 The consultancy joint venture

**BUSINESS MODEL**

**RESEARCH CENTER**

- **PARTNERS**
  - To disseminate knowledge generated in the research center
  - Attract opportunities from industry
  - Both invest: time and money

**CONSULTING FIRM**

**EXAMPLES:**

Collaboration between Columbia Business School’s faculty, and PwC’s Strategy& (the former Booz & Company) in joint dissemination initiatives

**9.1.11 Short-term marketing collaboration**

**INSTITUTION**

1. Funds a project

**RESEARCH CENTER**

3. With this the institution gains visibility

**EVENTS & REPORTS**

2. Create specific marketing opportunities

**MASS PUBLIC**

Fee

Attend and read

**Benefit to the institution:**

1. Access to new idea/technology
2. Access to centers’ faculty
3. Network with other industries
4. Access to facilities
5. Employing center’s graduates

The National Science Foundation’s Engineering research centers reported in 2012 that, among their 20 associated centers, industry membership ranged from seven to 47 companies per center (averaging 23%)

**9.1.12 Long-term marketing collaboration**

**INSTITUTION**

1. A firm is building a brand incrementally

**RESEARCH CENTER**

3. With this the institution gain visibility

**MEDIA ELITES MASS PUBLIC**

Funds

Attend and read

**EVENTS & REPORTS**

2. Capture audience

The focus is that the audiences associate the firm with attractive or socially worthwhile research

Faculty chairs at Duke University in North Carolina can be established for between $1 million and $5 million depending on the sponsored profile, from a visiting professor to the dean
10 LACK OF BRAND

ANSWER THESE QUESTIONS TO CHECK WHETHER YOU HAVE THIS PROBLEM:

A. Do you lack a recognizable brand or experienced researchers?
B. Are you unable to attract industry partners for collaborations?
C. Are you consolidated but want to extend your institution’s brand?

10.1 BEST PRACTICE:

WRITE MEDIATIC REPORTS WITH COMPLEMENTARY BRANDS

A quick way to establish a brand is to use brand architecture by leveraging other big brands.

SOLUTION TO THIS PROBLEM:

Regarding the high costs of a publication: the creation of results + cost of researchers + writing the results of the research + publishing + distribution.

Collaborate with those brands to leverage research or dissemination capabilities.

POSITIONED INSTITUTIONS OR COMPANIES

OPINNO

EXAMPLE: Opinno

Opinno uses a partnership to disseminate in Latin America and Spain the 10 most breakthrough technologies of the year (among other tech-related findings) according to the MIT Technology Review.

HELPS TO:

- Disseminate the knowledge and content
- Increase the brand awareness of the center

IMPORTANT LESSON FOR CENTERS:

A quick way to establish a brand is to use brand architecture by leveraging other big brands.
10 LACK OF BRAND

ANSWER THESE QUESTIONS TO CHECK WHETHER YOU HAVE THIS PROBLEM:

A. Are you creating more value than the value perceived by the non-academic market?

B. Are your researchers unaware of who to contact within your organization to maximize the impact and outreach of their research results?

BEST PRACTICE:

RETHINK YOUR COMMUNICATIONS

Create a clear and scalable process of internal and external communications that maximizes the value proposition offered to media.

SOLUTION TO THIS PROBLEM:

3 PRINCIPLES IDENTIFIED TO OPTIMIZE THE OUTREACH OF RESULTS:

01 MAP FUNCTIONS

Who do I have to contact when I have to do something related to communication? Then give this map to each researcher.

“WHO SHOULD I CONTACT IF I …?”

02 REDEFINE PROCESSES IN CASCADE

Communication units of research centers were sometimes internally unconnected. Two people were doing almost the same task, talking with the same external contact or using only a few channels to communicate. However, a cascade process leverages your internal structure to maximize the external impact. E.g.:

03 REJECTION RATE FOR ARTICLES

Give specific pieces of information to a very segmented type of journalist, based on her interests.

Generate internal CRM with all journalists segmented by topic of interest and geographic areas: know to whom specifically you should write.

EXAMPLE: University of Michigan

Centers at University of Michigan are already applying these principles, getting best practices from the tool kit that the university shares among its research units.

HELPS TO:

- Increase the communication impact of the knowledge generated
- Solve the problems of work in external communication silos

IMPORTANT LESSON FOR CENTERS:

- Discovery press release
- Specialized magazine
- Conference
- Social networks

Research Mature
Innovation Mature
Research Young
Innovation Young
LACK OF EXPERIENCED RESEARCH TEAM

ANSWER THESE QUESTIONS TO CHECK WHETHER YOU HAVE THIS PROBLEM:

A. Is your center too young to attract funding or ad hoc research contracts?
B. Do you lack internal research capability?

BEST PRACTICE:

PARTNER WITH RECOGNIZED PROFESSORS
To improve your research capabilities by partnering with researchers who are renowned

SOLUTION TO THIS PROBLEM:

THE RESEARCH CENTER
partner with
PROFESSORS

Leverage external brands by creating awards for top researchers

RESEARCHERS
E.g.: the submission of a proposal to obtain public funds

OR

LONG-TERM COLLABORATIONS
E.g.: create long-term research projects, or a series of lectures

EXAMPLE: IBM Faculty Awards

The IBM Faculty Awards, support basic research, curriculum innovation, and educational assistance in specific focus areas. The program is intended, firstly, to foster collaboration between researchers at leading universities worldwide and those in IBM research, development, and services organizations. Second, to promote innovation to stimulate growth in disciplines and geographic areas that are strategic to IBM.

HELPS TO:

Have more credibility and gain initial traction in the market

STAGE 3: COMMERCIALIZATION

11

11

32

32
UNCLEAR VALUE PROPOSITION

ANSWER THESE QUESTIONS TO CHECK WHETHER YOU HAVE THIS PROBLEM:

A. Does the market fail to understand what you are doing in your research center?

B. Do you lack a network for university-industry collaborations?

C. Do you have a technology that generates value of which your customers fail to perceive?

BEST PRACTICE:

LECTURE TRANSLATING RESEARCH INTO IMPACT

To have clearly identified the benefits to a potential client

SOLUTION TO THIS PROBLEM:

01. PERIODIC LECTURES TO INDUSTRY LEADERS

Research results

Qualitified impact

In these lectures, professors with experience in industry-university collaboration or the director of the technology-transfer unit, would explain the implications and applications of the research projects, explaining the value propositions via quantified value and success cases

02. INCLUDE SERIES OF INDUSTRY SPEAKERS

Industry professionals invited to the center for speaking engagements, followed by a meeting with center’s faculty and a look at the center’s facilities

EXAMPLE: MIT Technology Review

MIT Technology Review has a magazine that shares insights from faculty (and other experts) to equip its audiences with the intelligence to understand a world shaped by technology

HELPS TO:

Raise the awareness and visibility of the research center

Network with other industry members during or after the speaking session
ANSWER THESE QUESTIONS TO CHECK WHETHER YOU HAVE THIS PROBLEM:

A. Do you have a recognized and renowned research center but lack industry collaborations?
B. Have you spoken already to all the big players in your sector and did not found how to keep your client portfolio growing?

BEST PRACTICE:

ADAPT THE SIZE OF TEAMS

In some ecosystems, the majority of enterprises are small- or medium-size and doesn't have specialized resources to work with complex research teams. Adapting the size of those can ease the collaboration.

SOLUTION TO THIS PROBLEM:

METRICS ARE MAXIMIZED

When the size of the research team is between two and three researchers, according to several studies.

IMPORTANT:

Consider the relevant industry’s characteristics when designing the internal structure of the research center and the research teams.

BARRIERS

are generally caused by the center's internal politics and bureaucracy.

EXAMPLE: Several Spanish Research Centers

In Spain, 99.9% of local industry is composed of small and medium-sized enterprises (SMEs). The budget, expertise, and internal structures of these companies are unable to absorb large research teams. For instance, SMEs might not have enough budget or they might lack the internal knowledge to talk with the research center’s experts or absorb the center’s discoveries.

HELPS TO:

Improve the ease of collaborating with SMEs.

IMPORTANT LESSON FOR CENTERS:

- Research Mature
- Innovation Mature
- Research Young
- Innovation Young
**BEST PRACTICE:**

**MAP DECISION MAKERS AND THEIR KPIS**

Understand the mind-set of the academic or executive with whom you are sitting.

---

**SOLUTION TO THIS PROBLEM:**

**GAINING AN UNDERSTANDING OF THE ORGANIZATION**

Taking into account 3 considerations:

- **01 RESEARCH MAP**
  Used to identify their research interests

- **02 KPIS**
  Of the stakeholders (also preferences)

- **03 RESEARCH PYRAMID**
  To identify the characteristics of their roles and to understand the mind-set of each researcher

**Difference between:**
- Academics roles: KPIs related to academic indicators
- Executives roles: economic indicators

**Keep in mind the seniority of the research:**
- Young: focused priorities in publishing
- Senior: diverse indicators (less pressure to publish)

**Have a network map of your institution, know the key decision-makers (then you could focus explanation of initiatives of what they value more)**

**EXAMPLE: Merck**

Merck introduced a scouting organization within the Word Wide Licensing and Knowledge Management group, growing from 11 to 65 employees in 2011. It is a team that generates novel opportunities for the company, developing connections with Merck’s internal research units and with outside partners such as entrepreneurs and venture capital firms.

** HELPS TO:**

- Increase the chances of obtaining internal approval of initiatives

---

**IMPORTANT LESSON FOR CENTERS:**

- Research Mature
- Innovation Mature

---

---
NONACCEPTANCE OF GENERATED RESEARCH RESULTS

ANSWER THESE QUESTIONS TO CHECK WHETHER YOU HAVE THIS PROBLEM:

A. Have you delivered the results of an ad hoc research project but it has not been approved?
B. Have you been involved in a research project with very undefined end-date?
C. Do you usually exceed the initial budget of ad hoc research projects?

BEST PRACTICE:

PRE-SELL YOUR SOLUTION
Align industry-university collaboration

SOLUTION TO THIS PROBLEM:

MISALIGNED PREFERENCES

RELEASE CYCLE: Long
PREFERENCES: Academic
RESULTS: Theoretical

UNIVERSITY

RELEASE CYCLE: Short
PREFERENCES: Economics
RESULTS: Applicable

INDUSTRY

TO ALIGN THIS COLLABORATION

01
DEFINE A CLEAR STRATEGY & LISTEN
Detailed deliveries, timings and scope to avoid any misalignment

02
PRE-SELL RESULTS
Before the final delivery
Meet and talk regularly

EXAMPLE: Audi + Technical University of Munich

Audi proposed a strategic collaboration with the Technical University of Munich (TUM), through the establishment of a research institute near the Audi headquarters that would support more than 100 Ph.D. students working on technology and innovation issues vital to Audi’s competitiveness.
LACK OF PUBLIC FUNDING

ANSWER THESE QUESTIONS TO CHECK WHETHER YOU HAVE THIS PROBLEM:

A. Do you lack the experience and in-depth expertise to apply for public funds?

B. Do you have a very low acceptance rate of proposals for public funding?

BEST PRACTICE:

BUILD A UNIT FOR RAISING PUBLIC FUNDS

To increase the acceptance rate, hire a specialist or partner with external consultancies.

SOLUTION TO THIS PROBLEM:

DIFFERENCE DIFFICULTY BETWEEN PUBLIC AND PRIVATE FUNDING

- Public Sector
- Private Sector

DIFFICULTY

STEPS

+ Identify and connect with potential leads

- Agree on the exchange of goods or services

Apply the results in the organization

Extend the relationship

Prove the impact

EXAMPLE: Max Planck Innovation

Max Planck Innovation has set up various incubators to validate the industrial relevance of inventions resulting from basic research - to achieve closer links with the industry and the market.

HELPS TO:

- Improve the acceptance rate of public funding.
- Decrease the cost of preparing proposals, leveraging previous knowledge.

IMPORTANT LESSON FOR CENTERS:

To increase the acceptance rate of public funding, it is essential to hire a specialist or partner with external consultancies.
CONCLUSIONS
STAGE 3: COMMERCIALIZATION

2 SYMPTOMS OF BROKEN INNOVATION

ARE YOU FINDING IT DIFFICULT TO MONETIZE YOUR KNOWLEDGE ASSETS?
ARE YOU HAVING TROUBLE GETTING ACCESS TO INDUSTRY DATA AND NETWORKS?

8 CAUSES OF FAILURE

9 UNCLEAR BUSINESS MODEL
10 LACK OF BRAND
13 DISPROPORTIONAL RESEARCH TEAM
14 INTERNAL POLITICS AND BUREAUCRACY
11 LACK OF EXPERIENCED RESEARCH TEAM
12 UNCLEAR VALUE PROPOSITION
15 NON ACCEPTANCE OF GENERATED RESEARCH RESULTS
16 LACK OF PUBLIC FUNDING

BEST PRACTICES

9.1 Design a collaborative business model
9.2 Align your centers age and orientation
10.1 Write mediatic reports with complementary brands
10.2 Rethink your communications
11 Partner with recognized professors
12 Lecture translating research into impact
13 Adapt teams sizes
14 Map decision makers and their KPIs
15 Pre-sell your solution
16 Build a unit for raising public funds
Copyright© 2020 Josemaria Siota. All rights reserved. This report may not be reproduced or redistributed, in whole or in part, without the written permission of the authors. The authors, collaborators and partners accept no liability whatsoever for the actions of third parties in this respect. Some of the information in this report is based in the book Linked Innovation: Commercializing Discoveries at Research Centers. The authors, collaborators and partners have made every effort to use reliable, up-to-date and comprehensive information and analysis, but all information is provided without any warranty of any kind, expressed or implied. They accept no liability for any loss arising from any action taken or not taken as a result of information contained in this report or any reports or sources of information referred to herein or for any consequential, special or similar damages, even if advised of the possibility of such damages. This report may not be sold without the written consent of the authors, collaborators and partners.

This study is part of a project that has received funding from the European Union’s Erasmus+: Cooperation for innovation and the exchange of good practices under EAC/A03/2016 (grant agreement Nº 2017 - 2875 / 001 – 001).