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# TTO OPERATION AND SUSTAINABILITY TRAINING

Karadeniz Technical University

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# 1. Definition of Technology Transfer Office (TTO)

- Introduction
- SWOT Analysis

# Definition of Technology Transfer Office (TTO)

## Intruduction



**Technology transfer** refers to the process of transferring knowledge, skills, technologies, methods, or innovations from one organization, entity, or country to another.






**Technology Transfer Offices (TTOs)** are specialized units within academic institutions, research organizations, or public agencies that facilitate the transfer of knowledge, technologies, and innovations from research environments to industry and commercial applications.

Their primary role is to bridge the gap between academic research and its potential use in real-world products, services, or processes.

TTOs serve as intermediaries supporting the commercialization of new technologies in the market, with the aim of enhancing economic competitiveness. Recently, there has been a growing recognition of innovation's role in addressing societal challenges, referred to as **transformative innovation**. In this context, TTOs are expanding their scope and mission, tasked with acting as intermediaries aligning societal needs—beyond mere market demands—with potentially transformative technological solutions.

# Definition of Technology Transfer Office (TTO)

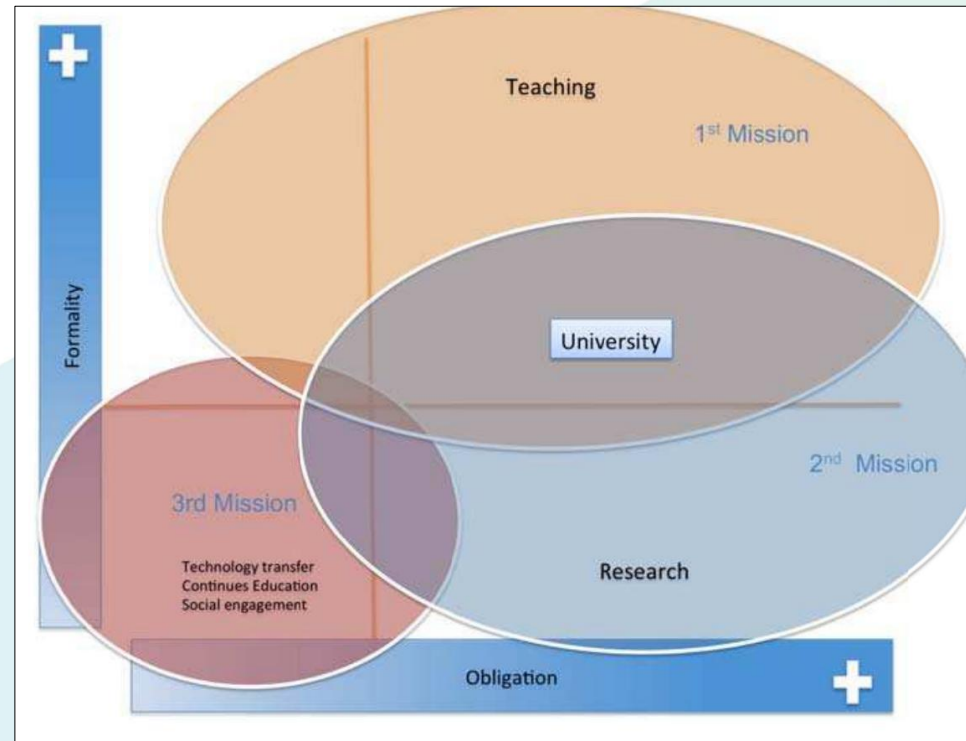
## Intruduction

-  TTOs are organisational structures that play a role in directing academic studies to national and international research projects, transferring them to the industry within the needs and commercialising them.
-  In terms of their general structure, TTOs act as an interface between universities, research institutes, students, investors and companies and operate in the direction of establishing matches and connections in line with the necessary needs.
-  TTOs provide consultancy and support to all stakeholders in all processes from knowledge to product, selection of industrial partners, identification of appropriate funding sources, project design activities, intellectual and industrial property rights applications, commercialisation and/or establishment of academic-based companies.
-  The success level of TTOs is measured by the strength of their institutional infrastructure, the effectiveness of university-industry collaborations, their performance in the protection and commercialisation of intellectual property rights, and the diversity and sustainability of the funding resources provided.
-  Successful TTOs create a strong bridge between both academic and industrial stakeholders, accelerate the process of transforming knowledge into products and provide competitive advantage at national and international level.

# Definition of Technology Transfer Office (TTO)

## Intruduction

As the grand challenges-oriented agenda gains rapid traction in the '**third mission**' goals of universities and public research organizations technology transfer offices (TTOs) have recently witnessed an expansion of their mission scope. In this context, TTOs are expected not only to transfer technology for economic returns in commercialization processes but also to maximize technology's positive social and environmental impacts.



# Definition of Technology Transfer Office (TTO)

## SWOT Analysis of Countries

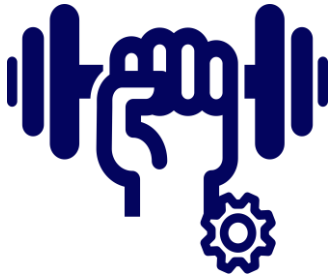
The SWOT analysis identifies the key internal and external factors affecting the technology transfer (TT) ecosystems in Greece, Bulgaria, Türkiye, and Romania. This detailed assessment allows for a deeper understanding of strengths, weaknesses, opportunities, and threats at both national and regional levels.



# Definition of Technology Transfer Office (TTO)

## SWOT Analysis of Countries

### STRENGTHS

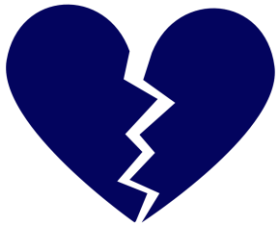


- **Greece:** Strong research output from institutions like CERTH and the National and Kapodistrian University of Athens. EU funding opportunities through Horizon 2020 and NSRF enhance TT capabilities.
- **Bulgaria:** Presence of the Bulgarian Academy of Sciences (BAS) and Sofia Tech Park as innovation drivers. Strong academic research base.
- **Türkiye:** Well-established TT structures, supported by TÜBİTAK's 1513 and 1601 programs. Technoparks and incubation centers such as METU Teknokent play a significant role in commercialization.
- **Romania:** Innovation hubs like Măgurele Science Park and ReNITT foster TT collaborations. EU-backed funding opportunities available to research institutions.

# Definition of Technology Transfer Office (TTO)

## SWOT Analysis of Countries

### WEAKNESSES



- **Greece:** Bureaucratic inefficiencies delay patenting and commercialization. Limited private-sector involvement in TT initiatives.
- **Bulgaria:** Weak IP protection and limited expertise in commercializing research. Fragmented TT ecosystem.
- **Türkiye:** Limited early-stage funding for TT startups. Regulators' demands for long-term commercialization forecasts are impacting TT venture capital investment.
- **Romania:** Low private-sector engagement and underdeveloped R&D funding mechanisms. Weak coordination between industry and academia.

# Definition of Technology Transfer Office (TTO)

## SWOT Analysis of Countries

## OPPORTUNITIES

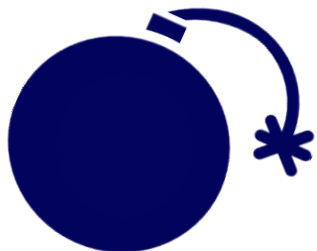


- **Greece:** Expansion of public-private partnerships could increase industry participation in TT. Digitalization and Industry 4.0 trends present growth potential.
- **Bulgaria:** Strengthening innovation policies and increasing venture capital investment. Regional collaboration with EU partners.
- **Türkiye:** Leveraging technoparks and research centers to attract international investors. Expansion of technology-based entrepreneurship.
- **Romania:** Improved policy coordination and increased investment in green and digital innovations. Cross-border TT initiatives, such as T3N-BSB, offer regional synergies.

# Definition of Technology Transfer Office (TTO)

## SWOT Analysis of Countries

## THREATS



- **Greece:** Economic instability threatens long-term TT funding. Stronger TT ecosystems in other EU nations pose competitive challenges.
- **Bulgaria:** Brain drain of skilled researchers to Western Europe. Weak enforcement of innovation policies.
- **Türkiye:** High dependence on public funding. Economic fluctuations impact R&D investments.
- **Romania:** Delays in accessing EU structural funds. Administrative inefficiencies hinder effective TT policy implementation .

## 2. History (Emergence and Development) of TTO in the World

- TTOs in Greece
- TTOs in Romania
- TTOs in Bulgaria
- TTOs in Türkiye

# History (Emergence and Development) of TTO

## in the World

- 1912-** Frederick Cottrell, a faculty member at the University of California, laid the foundations of a non-profit organisation called **Research Corporation in 1912** and established a platform where he and all academicians across the country could manage their inventions. Thus, both the researchers will be able to earn a licence income from their licensed inventions and the research institutions to which they are affiliated will be able to earn a share of this income
- 1925-** Harry Steenbock who was a **professor of biochemistry at the University of Wisconsin-Madison** made an effort to make an economic contribution to the research budget at the University of Wisconsin by licensing his patents on vitamin D. These examples were followed by Iowa State in the 1930s, MIT in the 1940s, the University of Minnesota in the 1950s and the University of Utah in the 1960s.
- 1960-** According to a study by the Association of University Technology Managers (AUTM), there were only 7 TTOs or TLOs (Technology Licensing Offices) in the USA in the 1960s. Stanford University established its Technology Licensing Office in 1970 and the number of TTOs established in the 1970s increased to 15.

# History (Emergence and Development) of TTO

## in the World

**1980-** With increasing examples of technology licensing, the **Bayh/Dole Act**, which was implemented in 1980, was a move that encouraged the establishment of TTOs across the country. The number of TTOs in the USA continued to increase, reaching 82 in the 1980s and 173 in the 1990s.

### Bayh-Dole Act (1980)

No new drugs or vaccines were commercialized when the government took patent rights away from inventing organizations.

More than 200 new drugs and vaccines developed through public-private partnerships.

BEFORE ↔ AFTER

# History (Emergence and Development) of TTO

## The Beginning of TTOs in Europe

- 1950-** The foundations for technology transfer in Europe were laid in the efforts of reconstruction and economic growth after the Second World War, and during the 1950s and 1960s, some initial steps towards technology transfer were taken between a few leading countries in Europe (notably Germany and the UK).
- 1980-** The establishment of the first technology transfer offices in Europe started in countries such as **the UK and Germany**. In the 1980s, universities in the UK, inspired by American examples, started to make more efforts to increase technology transfer. During this period, institutional organisations such as **the University of Cambridge** led the way.
- 1990-** The European Union turned more strongly towards technology transfer through its research and innovation policies. In 1994, the European Commission started to initiate projects to promote technology transfer and innovation within the framework of the research framework programme known as the "**Framework Programme**".

# History (Emergence and Development) of TTO

## The Beginning of TTOs in Europe

- 2000-** Many European universities and research institutes started to establish TTOs for commercial activities and commercialisation of research results. In the early 2000s, the European Commission strengthened policies aimed at enhancing research and innovation capacity, in particular through programmes such as Horizon 2020.
- 2010-** TTOs were not only limited to technology sales and licensing, but also started to operate in areas such as **entrepreneurship, start-up support, business development and investor relations.**

# History (Emergence and Development) of TTO

## TTOs in Türkiye

Year	Main Event	Description
1963	State Planning Organization (SPO) and Publication of the 1st Development Plan (DPT, 1963)	Türkiye's first five-year DP was published. Science, technology and R&D targets were included in these plans for the first time.
1963	Establishment of TÜBİTAK	TÜBİTAK was established to support Türkiye's scientific research and technology development activities.
1990	Establishment of KOSGEB	KOSGEB was established to support SMEs and began to make significant contributions to R&D activities.
2001	Adoption of the Technology Development Zones Law No. 4691 <sup>5</sup>	Legal regulations were provided for the establishment and operation of technoparks in Türkiye.
2004	Publication of Vision 2023 Strategy Document (TÜBİTAK, 2004)	A long-term strategy was determined to develop Türkiye's R&D and innovation ecosystem.
2006	Adoption of Law No. 5449 <sup>12</sup> on the Establishment, Coordination and Duties of Development Agencies	In order to support regional development, DAs were established throughout Türkiye and projects were initiated to encourage TT and R&D activities.
2008	Adoption of Law No. 5746 <sup>6</sup> on Supporting Research and Development Activities	Incentives were introduced for R&D and innovation activities, tax reductions and personnel support were provided.
2014	TÜBİTAK 1601 Program and TTOs Support Program (TÜBİTAK, 2014).	A support program was launched to increase the capacity of TTOs established at universities.
2017	Adoption of Industrial Property Law <sup>7</sup> No. 6769 <sup>8</sup>	Regulations were made for the commercialization of inventions made at universities and the protection of patent rights.
2017	Entry into Force of the Regulation on Technology Transfer Office of Higher Education Institutions <sup>4</sup>	The regulation regulating the structures and operations of TTOs established at universities was published, and TT processes were accelerated.

# History (Emergence and Development) of TTO

## TTOs in Türkiye



- Sabancı University (2001)
- Middle East Technical University (METU) (2007)
- Istanbul Technical University (ITU) (2013)
- Boğaziçi University (2012)
- Karadeniz Technical University (2012)

# History (Emergence and Development) of TTO

## TTOs in Greece

Year	Main Event
1985	Introduction of Law 1514/1985, recognizing the importance of knowledge and technology transfer from research institutions to industry
1987	Enactment of Law 1733/1987, specifically addressing technology transfer, technological innovation, protection of inventions, and providing a legal basis for the commercialization of research and the exploitation of patents. It was a landmark in the formal establishment of Technology Transfer Offices (TTOs) within universities and research centers, facilitating the legal and administrative processes required for research commercialization. Also promoted collaborations between public research organizations and private companies, setting the groundwork for Greece's evolving spin-off ecosystem
1990s	Law 2121/1993 further developed intellectual property (IP) protection, particularly focusing on copyright. Establishment of first TTOs in major universities to facilitate the commercialization of academic research outputs, allowing researchers to transform their scientific discoveries into marketable products and services.
2007	PRAXI Network's creation to enhance national TT efforts, which became a central pillar in supporting research commercialization. It supports technology transfer by assisting research institutes in connecting with businesses, developing commercial strategies, and navigating the complexities of intellectual property rights
2008	Financial crisis impacts the Greek R&I landscape, posing challenges in attracting talent and investment.
2010	Despite the robust legal framework provided by Laws 1514/1985 and 1733/1987, the full institutionalization of technology transfer in Greece only gained traction in the 2010s. The establishment of National Guidelines for the Protection of Intellectual Property by the Hellenic Industrial Property Organisation (OBI) further standardized processes and provided a coherent framework for patent filings and licensing agreements.
2014	A significant turning point came with the National Strategic Reference Framework (NSRF) for 2014-2020, which included dedicated funding to establish and develop TTOs across the country. National Strategic Reference Framework (NSRF) dedicated significant funds to establish and grow 28 National Research Infrastructures (NRIs) across Greece
2018	Establishment of the EU Technology Transfer Skills Centre and the Alliance of Technology Transfer Professionals (ATTP), promoting international standards and methodologies for technology transfer.
2020	End of the NRI development program
2021	Law 4864/2021 on spin-offs introduced a comprehensive framework for the creation and operation of technology-based startups originating from academic research. This law was a game-changer, allowing universities to more efficiently establish spin-off companies, defining the roles of public research organizations and researchers in the commercialization process, and streamlining administrative procedures. Public tender launched to support the creation and operation of TTOs in Greek universities and research center. The General Secretariat for Research and Innovation (GSRI) launched two major funding calls to strengthen Technology Transfer Offices (TTOs) at universities and research centers in Greece. These calls, known as Phase A and Phase B, are part of a broader initiative to enhance the technology transfer ecosystem and promote the commercialization of academic research.

# History (Emergence and Development) of TTO

## TTOs in Greece



- National Technical University of Athens (NTUA) (1990)
- Aristotle University of Thessaloniki (AUTH) (1990)
- The Centre for Research and Technology Hellas (CERTH)
- National and Kapodistrian University of Athens (NKUA) (2019)
- Aristotle University of Thessaloniki (AUTH) (2015)
- University of Patras (2004)

# History (Emergence and Development) of TTO

## TTOs in Bulgaria

Year	Main Event
Pre-1990s	Early Efforts in Technology Transfer: Socialist Era: State-driven industrialization fosters collaborations between research institutions and state-owned enterprises, with innovation efforts focused on national economic goals. However, these collaborations lacked the formalized, market-driven processes seen in modern technology transfer systems.
1990s	<p>Transition to a Market Economy</p> <ul style="list-style-type: none"> <li>• 1991-1993: Following the political changes of 1989, Bulgaria transitions to a market-oriented economy. This shift paves the way for more open and market-driven innovation practices</li> <li>• 1993: Initial reforms to Bulgaria's Intellectual Property (IP) laws align the country with international standards, creating the foundation for future technology transfer activities.</li> </ul>
2000s	Creation and Early Development of TTOs: Bulgaria begins establishing its first Technology Transfer Offices (TTOs) at leading research institutions like the Bulgarian Academy of Sciences (BAS) and Sofia University. These offices are responsible for managing intellectual property, licensing agreements, and creating spin-offs based on academic research
Mid-2000s	Early Commercialization Successes: The Bulgarian Academy of Sciences (BAS) achieves one of Bulgaria's first major technology commercialization successes by licensing research innovations to external partners.
2010s	<p>Expansion of Tech Parks and Innovation Hubs</p> <p>2015: Sofia Tech Park is established as Bulgaria's first science and technology park, focusing on ICT, biotechnology, and green energy. It becomes a central hub for collaboration between academia, industry, and startups.</p> <p>2016: Varna Tech Park launches, emphasizing maritime technology, logistics, and renewable energy, leveraging Varna's strategic location on the Black Sea.</p> <p>2016: Plovdiv Tech Park is established, becoming Bulgaria's first privately funded entrepreneurial tech park, offering high-tech training, shared workspaces, and support for startups.</p>
Late 2010s	<p>Increased Global Integration</p> <ul style="list-style-type: none"> <li>• 2017: Sofia Tech Park partners with IBM, promoting research in cloud computing and AI, marking a milestone in Bulgaria's international technology collaborations.</li> <li>• 2018-2020: Bulgaria continues to integrate into the European innovation landscape through participation in EU-funded programs like Horizon 2020, supporting cross-border research collaborations.</li> </ul>
2020s	Institutionalization and Emergence of New Stakeholders :2020-2021: Growth in the involvement of venture capital firms like LaunchHub Ventures and Eleven Ventures, supporting the commercialization of research and early-stage startups.

# History (Emergence and Development) of TTO

## TTOs in Bulgaria



- Sofia University
- Plovdiv University
- Technical University of Sofia
- Technical University of Varna

# History (Emergence and Development) of TTO

## TTOs in Romania

Year	Key event	Description
1999	Establishment of DFCTT	Creation of the Continuous Training and Technology Transfer Department at the "Dănearea de Jos" University in Galati.
2003	HG 406/2003	Adoption of the Government Decision on the organization of technological transfer entities.
2015	Establishment of CTT-UGAL	The Technological Transfer Center of the "Dănearea de Jos" University in Galati was established.
2017	CTT-UGAL accreditation	CTT-UGAL was accredited as an entity in the national infrastructure of innovation and technological transfer (ReNITT).
2020	Regional Operational Program 2014-2020	Launching the technology transfer promotion program, supporting research and innovation projects.
2023	CTT-UGAL re-accreditation	CTT-UGAL has been re-accredited and ranks 42nd in ReNITT.
2023	POCIDIF (Competitiveness Operational Program - Investments in Digitization and Innovation in Phase II)	Essential program at national level in the field of Research, Development and Innovation (RDI) and digitization, aiming to support initiatives that promote innovation, efficiency and digitization in various sectors, including the cultural one.

# History (Emergence and Development) of TTO

## TTOs in Romania



- The Romanian Association for Technology Transfer and Innovation (ARoTT)
- Technology Transfer Center Polytech (Gheorghe Asacgi Technical University of Iasi),
- CTT ECOIND Technology Transfer Center
- CTT - UGAL Technology Transfer Center

## 3. General TTO Structures

# General TTO Structures

## Introduction

Technology Transfer Offices (TTOs) are usually created within a university in order to manage its intellectual property (IP) assets and the transfer of knowledge and technology to industry. Sometimes, the mandate of TTOs with respect to collaborative research includes any interaction or contractual relation with the private sector. Common names for such offices differ.



- Technology Licensing Office (TLO),
- Technology Management Office,
- Research Contracts and IP Services Office,
- Technology Transfer Interface,
- Industry Liaisons Office,
- IP and Technology Management Office
- Nucleus of Technological Innovation.

# General TTO Structures

## Introduction

Technology transfer organizations (TTOs) come in various forms depending on their structure, mission, and the type of institutions they serve.

There are many issues to be taken into consideration when deciding on the institutional identity of TTOs.



The main ones are the existing legal frameworks regarding the ownership of intellectual property rights and the status of such institutions, the public and other support mechanisms that TTOs can benefit from, the services planned to be provided, and the expectations and attitudes of the relevant universities or research institutions.

The missions of these structures should be in line with the mission of the university or research institution with which they are associated, and their activities should add value to and support the institution with which they are affiliated or associated.

# General TTO Structures

## Introduction

In the **OECD** study, three types of TTOs are classified according to their organisational structure and this classification is widely accepted.

1. TTOs operating as a unit (specialised department type) of a university or scientific research institution,
2. TTOs operating as a wholly owned subsidiary of a university or scientific research institution,
3. TTOs that are associated with more than one university or scientific research institution, but continue their activities with a public or private independent identity (independent intermediary).

In addition to the generally accepted classification, **Technology Development Zones** in our country can also be established as TTOs, where the management company is a partner.



# General TTO Structures

## Introduction

There is no clear distinction as to under what conditions and circumstances TTOs will be established and with what kind of corporate identity. In some studies, the following were taken into consideration as selection criteria:

- Existing legal frameworks regarding intellectual property ownership and the status of such institutions,
- Public and other support mechanisms that TTOs can benefit from,
- Services planned to be provided, and expectations and attitudes of relevant universities or research institutions.

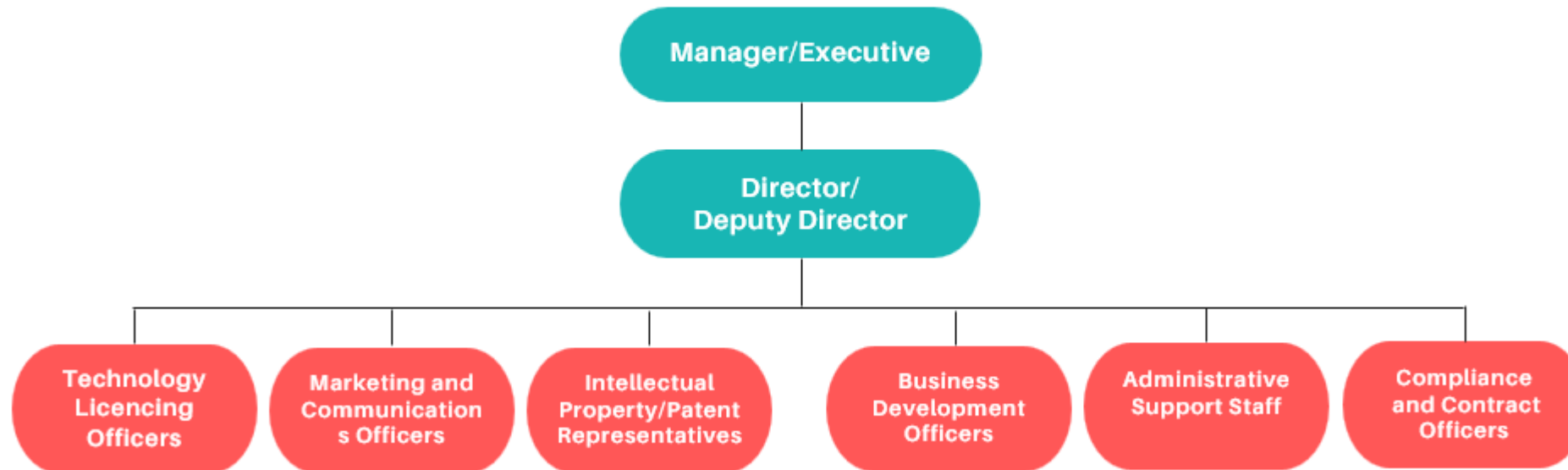


## 4. Organisational Structure of TTO

# Organisational Structure of TTO

## Hierarchical Roles and Responsibilities

### HIERARCHICAL ROLES IN TTOS



# Organisational Structure of TTO

## Hierarchical Roles and Responsibilities

### Manager/ Executive

Provides strategic leadership. He/she oversees TTO's operations and ensures that they are aligned with the mission and goals of the organisation. Develops policies, manages budgets and represents TTO in high-level negotiations and external partnerships.

### Director/ Deputy Director

Assists the Director in strategic planning and management. Oversees specific functional areas such as licensing, intellectual property (IP) management or business development.

### Technology Licencing Officers

Evaluate invention disclosures and market potential and develop commercialisation strategies. They also negotiate licensing agreements and manage relationships with licensees.

### Compliance and Contract Officers

Ensure that all agreements comply with corporate policies and legal requirements. They manage material transfer agreements, confidentiality agreements and other contractual documents.

# Organisational Structure of TTO

## Hierarchical Roles and Responsibilities

### Marketing and Communications Officers

Develop marketing materials. Manage TTO's online presence and organise events to encourage industry participation to showcase available technologies.

### Intellectual Property/Patent Representatives

Manages the processes of patent applications and intellectual property protection. They work closely with researchers and legal counsel to ensure intellectual property protection and compliance.

### Business Development Officers

Identify and develop relationships with industry partners, explore new market opportunities and promote the organisation's technologies to potential investors and collaborators.

### Administrative Support Staff

Provides administrative support, including planning, record keeping and financial management.

## 5. Operational Processes

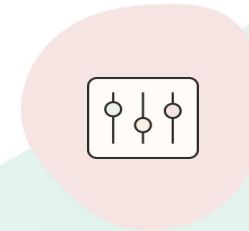
- Key workflows
- Best practices

# Operational Processes

## Key workflows



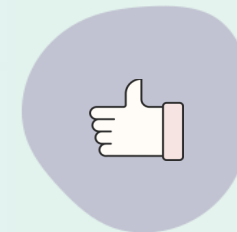
**Intellectual Property (IP) Management**



**Industry Collaboration**



**Licensing and Commercialisation**



**Venture Support and Incubation**

# Operational Processes

## Key workflows



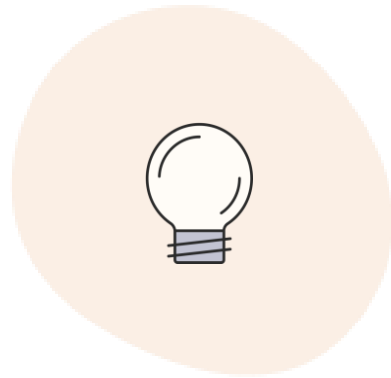
### Intellectual Property (IP) Management

TTOs identify, protect and manage the intellectual property assets of the organisation.

This includes assessing inventions for patentability, ensuring appropriate IP protections and auditing patent portfolios.

# Operational Processes

## Key workflows



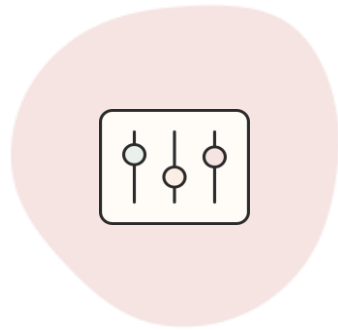
### Licensing and Commercialisation

TTOs negotiate licensing agreements with companies or support the creation of subsidiary ventures to bring technologies to market.

This involves structuring agreements that benefit both the organisation and the licensee or start-up company

# Operational Processes

## Key workflows



### Industry Collaboration

The industrial cooperation unit; provides a bridge between the university and the industry to develop joint projects, provide consultancy services and bring academic knowledge together with industrial needs.

# Operational Processes

## Key workflows



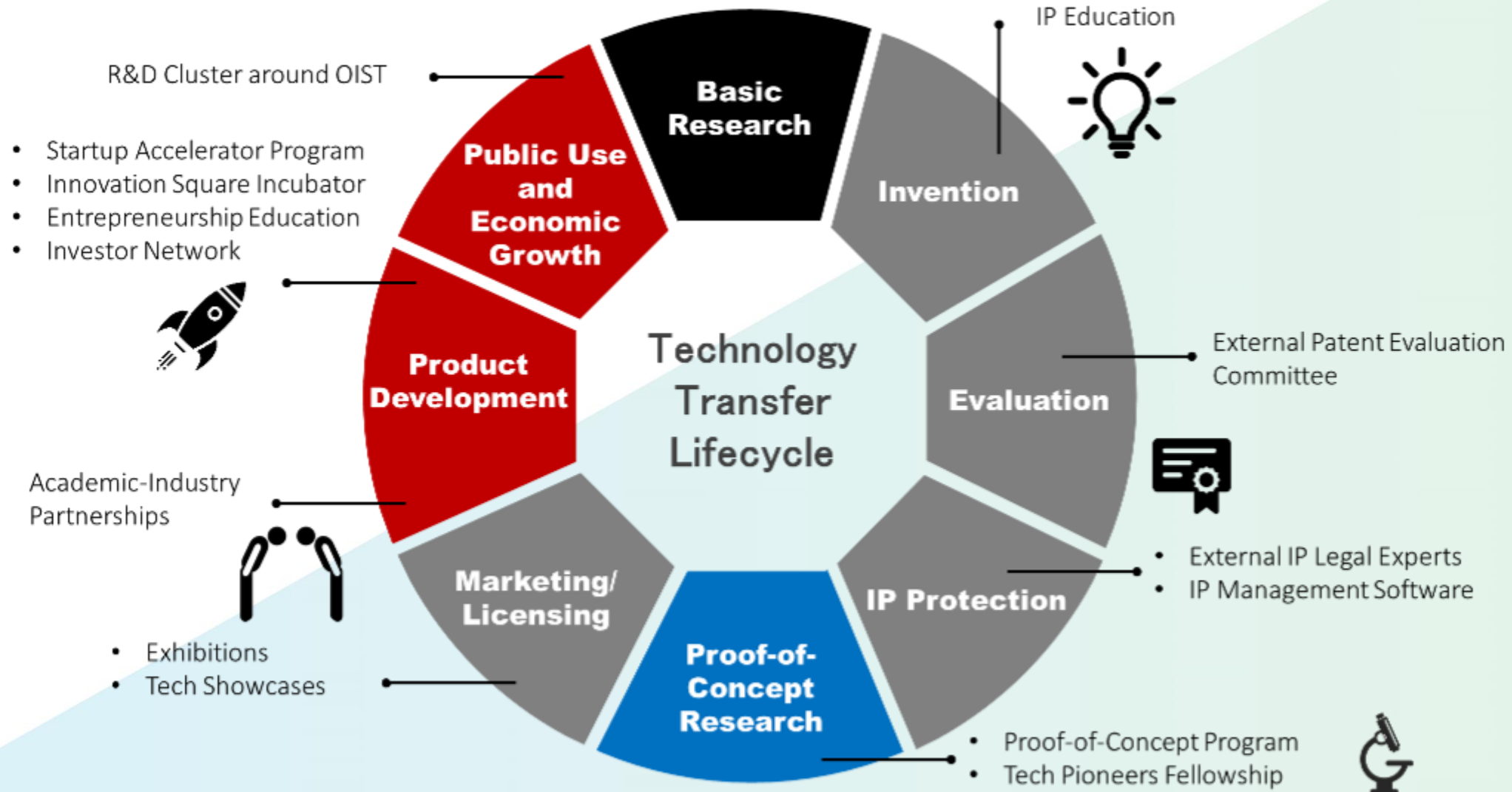
### Venture Support and Incubation

Supports the formation and growth of startups by providing resources and guidance to entrepreneurs.

This support includes business development guidance, access to funds and incubation services.

# Operational Processes

## Key workflows



# Operational Processes

## Key workflows

### Invention

This is the foundation of the technology transfer process. It involves fundamental scientific exploration carried out by researchers, typically within universities or research institutions. The primary goal is to expand knowledge without immediate commercial intent. However, this stage often leads to new discoveries or insights with potential practical applications.

### Basic Research

At this stage, a novel idea or breakthrough arises from research—something that is potentially useful, unique, and innovative. Researchers document their inventions, often by submitting an invention disclosure to their institution's Technology Transfer Office (TTO), marking the formal beginning of the commercialization pathway.

# Operational Processes

## Key workflows

The TTO assesses the invention's novelty, potential market, commercial viability, and patentability. This evaluation helps determine whether the institution should invest in protecting and developing the invention further. It involves technical, legal, and market analyses.

### Evolution

If the invention is deemed promising, appropriate intellectual property (IP) protection—usually in the form of patents—is pursued. This legal safeguarding ensures that the rights to the invention are secured, which is crucial for attracting future investment and commercial partners.

### IP Protection

# Operational Processes

## Key workflows

Additional research and development activities are conducted to validate the invention's functionality, feasibility, and market potential. This phase may involve prototyping, testing, or pilot studies, aiming to reduce technical risks and demonstrate that the idea works in real-world settings.

**Proof of  
Concept  
Research**

Once the technology shows promise, the TTO actively markets it to potential licensees—such as established companies or start-ups. Licensing agreements are negotiated to allow these external entities to develop, use, or sell the technology in exchange for financial returns (e.g., royalties).

**Marketing/  
Licensing**

# Operational Processes

## Key workflows

The licensed entity undertakes further development to transform the invention into a market-ready product or service. This stage may involve engineering, regulatory approvals, manufacturing scale-up, and customer testing. The goal is to prepare the innovation for commercial launch.

### Product Development

The final stage sees the technology entering the market, where it can improve lives, solve problems, or increase efficiency. Successful commercialization drives economic growth by creating jobs, generating revenue, and promoting innovation-driven competitiveness in society.

### Public Use and Economic Growth

# Operational Processes

## Best Practices

### AVC System in China

**Company:** PJM (the largest regional power grid company in the USA)

**University:** Tsinghua University (China)

**TTO:** Tsinghua University's Technology Transfer Office



In 2009, through the TTO, a collaboration was initiated between Tsinghua University and PJM. Within the scope of this cooperation, the AVC system, for which Tsinghua University has independent intellectual property rights, was integrated into the PJM power grid and tested in the USA. This was the first example of the successful transfer of China's advanced power grid control technology to the US.

# Operational Processes

## Best Practices

### Czech Republic Biomechanical Footwear: Healing Collaboration

**Company:** Boty J HANÁK R, Ltd. Company

**University:** Masaryk University

**TTO:** Masaryk University's Technology Transfer Office



The university's Technology Transfer Office (TTO MU) contributed to the commercialization of the innovative solution by undertaking patent protection, legal support and promotion activities in the cooperation. This study demonstrates the success of academia-industry collaboration in developing healthy living solutions.

## 6. Stakeholder engagement and collaboration strategies

- Critical success factors in collaboration strategies

# Stakeholder engagement and collaboration strategies

## Introduction



Technology transfer depends on coordination across multiple organizations.

Although stakeholders play different roles, partnerships among stakeholders are needed to create successful transfers.

# Stakeholder engagement and collaboration strategies

## Critical success factors in collaboration strategies

- Managing stakeholders with social responsibilities (economic, legal, environmental, and ethical).
- Discovering stakeholder needs and constraints
- Communicating and interacting with stakeholders
- Understanding stakeholder interests.
- Identifying stakeholders accurately.
- Maintaining good rapport.
- Analyzing conflicts with and among stakeholders.



# Stakeholder engagement and collaboration strategies

## Critical success factors in collaboration strategies

- Accurately predicting stakeholder influence. Formulating a strategy for managing stakeholders.
- Predicting stakeholder reactions to strategy implementation Decision making
- Analyzing stakeholder influence and relationships throughout the process
- Assessing attributes (power, legitimacy, and urgency).
- Seeking compromises for conflicts
- Creating a clear mission statement.
- Assessing stakeholder behavior.




## 7. Financial Sustainability and Revenue Models in Technology Transfer Offices

- The Importance of Financial Sustainability of TTOs
- Financial Sustainability Strategies for TTOs
- Budget Management and Risk Analysis
- Financial Planning
- Revenue Models and Fundraising Methods
- Business Development and Growth Strategies
- Sample Financial Sustainability Models for TTOs (Good practice examples from the world and Türkiye)

# Financial Sustainability and Revenue Models in Technology Transfer Offices

## Introduction

- 
- University Technology Transfer Offices (TTOs) aim to create economic value for universities and researchers through the commercialization of academic research. However, financial sustainability is one of the most important factors determining the long-term success of TTOs.
  - TTOs provide funding through various revenue models, such as patent licensing, industry partnerships, venture support services, and investment funds. However, many studies show that TTOs are difficult to be profitable in the short term and, especially for newly established offices, they require external funding to sustain their operations.

# Financial Sustainability and Revenue Models in Technology Transfer Offices

## The Importance of Financial Sustainability of TTOs



- ✓ The financial sustainability of TTOs is of great importance in terms of ensuring the long-term continuity of projects, strengthening infrastructure investments and enabling the diversification of services provided.
- ✓ A TTO without sufficient financial resources cannot effectively manage research and development processes and cannot sustain university-industry collaborations. Furthermore, if a financially independent and strong structure is not established, technology transfer processes may be disrupted and the continuity of the TTO may be jeopardized.
- ✓ There are examples of TTOs in around the world that have undergone structural changes or become passive due to their inability to ensure financial sustainability. Therefore, creating a sustainable income model is a critical factor in increasing the long-term success and impact of TTOs.

# Financial Sustainability and Revenue Models in Technology Transfer Offices

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# Financial Sustainability and Revenue Models in Technology Transfer Offices

## The Importance of Financial Sustainability of TTOs

### The main financial challenges faced by TTOs

- x High dependence on government support and external funds.
- x Lack of diversification of sources of income.
- x Inadequacy of long-term financing plans.
- x Uncertainties in the commercialization of R&D and innovation projects.



# Financial Sustainability and Revenue Models in Technology Transfer Offices

## Financial Sustainability Strategies for TTOs



- ✓ In this context, strategies such as increasing licensing and patent revenues, providing consultancy and training services, and taking an active role in joint R&D projects can be implemented.
- ✓ Income can be generated through stock or dividend models by providing mentoring and investment services to start-ups.
- ✓ Diversifying funding sources not only through national support but also through international financing opportunities such as European Union projects is of critical importance for sustainability.
- ✓ TTOs may license university technologies to industry partners to bring them to market or may gain financial gain by acquiring stock in subsidiary companies founded by university inventors.

# Financial Sustainability and Revenue Models in Technology Transfer Offices

## Budget Management and Risk Analysis

### Importance of TTO Budget Management

1. **TTO Structure Reporting to the Rectorate within the University:** This is the model in which the TTO operates directly under the university management.
2. **TTO Structured as a Joint Stock Company or Independent Organization Outside the University:** This is the TTO model that is structured as a joint stock company or an independent organization, affiliated with the university but as a separate legal entity.
3. **TTO Structure Established in Technocity/Technopark:** It is the TTO model operating within technology development zones or technoparks.



# Financial Sustainability and Revenue Models in Technology Transfer Offices

## Budget Management and Risk Analysis

### Importance of TTO Budget Management

- 4. TTO Structures Affiliated with Research Institutes:** This is the TTO model established within specific research institutes and focusing on the commercialization of the research outputs of that institute.
- 5. International Cooperation-Based TTO Models:** This is a TTO model created through the partnership of institutions from different countries and aims at international technology transfer.
- 6. Private Sector TTOs:** This is a TTO model established and operated entirely by the private sector, aiming to commercialize innovations within companies.



# Financial Sustainability and Revenue Models in Technology Transfer Offices

## Budget Management and Risk Analysis

### Importance of TTO Budget Management

- ❖ Another point to be considered in budget management is to determine and analyze the **financial risks** of the projects in advance. Creating possible risk scenarios and preparing action plans for these scenarios contributes to maintaining financial stability. In this way, TTOs can both ensure their financial sustainability and increase their capacity to generate resources for innovative projects and carry out a more effective technology transfer process.



# Financial Sustainability and Revenue Models in Technology Transfer Offices

## Risk Analysis

Possible Risk Name	Impact of Risk	Possible Precautions
<b>External Source Dependency</b>	Cuts in project-based funding, government support or private sector co-operation may lead to a budget deficit.	Alternative financing sources (private sector, donations, sponsorships) should be created. Income-generating services (training, counselling, etc.) other than public support should be increased.
<b>Uncertainty of Revenues</b>	It may cause unpredictable fluctuations in license revenues, patent sales or consulting services.	Diversification of intellectual property rights with a wider portfolio should be ensured. Regular revenue streams other than license and patent revenues should be established.
<b>High Operational Costs</b>	There is a risk that patent application fees, attorney's fees and specialized personnel costs may exceed the budget.	Cost analyses of projects should be made in detail in advance. Methods such as hybrid working or outsourced service procurement should be evaluated to reduce expenses.
<b>Project Failure</b>	R&D projects may result in loss of investment due to lack of commercialization or market acceptance.	Market analysis and feasibility studies should be carried out in advance. Process improvement strategies should be developed by learning from unsuccessful projects.
<b>Economic and Political Instability</b>	Domestic or global economic crises may reduce R&D investments.	Establish crisis management and emergency funds for projects.



# Financial Sustainability and Revenue Models in Technology Transfer Offices

## Risk Analysis

Possible Risk Name	Impact of Risk	Possible Precautions
<b>Regulatory and Legal Risks</b>	Patent infringement litigation, license disputes or regulatory changes may lead to additional costs.	Current legislation and regulations should be followed continuously.
<b>Academic-Commercial Conflict of Interest</b>	It may lead to a disturbance of the balance between academic freedom and commercialization objectives within the university.	Researchers should be trained in commercialization processes.
<b>Technology and Market Changes</b>	Rapid obsolescence of technology or changes in market needs can lead to wasted investments.	It should be ensured that investments are in line with market analyses.
<b>Lack of Institutional Capacity</b>	There may be insufficient staff specialized in budget planning, risk analysis and financial reporting.	Capacity should be increased by providing regular trainings to TTO staff, or staff specialized in financial planning and risk management should be recruited.
<b>Exchange Rate and Interest Rate Fluctuation Risks</b>	In international co-operation, exchange rate fluctuations or interest rate increases may have an impact on costs.	Dual currency contracts should be preferred against changes in exchange rates.



# Financial Sustainability and Revenue Models in Technology Transfer Offices

## Financial Planning

### Why Is Financial Planning Important for TTOs?

First, the balance between income and expenses must be established correctly in the financial planning process. TTOs must clearly define which sources of income they will generate and how these incomes will be managed. The payback periods of investments and potential sources of income must be carefully analyzed and future financial performance forecasted. This allows the office not only to continue its current activities but also to invest in new projects.



# Financial Sustainability and Revenue Models in Technology Transfer Offices

## Financial Planning

### Why Is Financial Planning Important for TTOs?

- ❖ Financial planning also includes capacity increase, human resource development and technology infrastructure investments in line with the growth targets of TTOs. It is necessary to determine the areas to be invested and to calculate the potential benefits that these investments will bring correctly. In this way, while the technological infrastructure is strengthened, qualified human resources can be created and thus the overall efficiency of the office can be increased.
- ❖ In addition, regular updating of financial planning is critical to adapting to changing market conditions and minimizing financial risks. Plans need to be flexibly adapted to market fluctuations, financial crises or new opportunities. This adaptation process will significantly increase the TTO's chances of future success.



# Financial Sustainability and Revenue Models in Technology Transfer Offices

## Revenue Models and Fundraising Methods

### SERVICE REVENUES

- Intellectual Property Licensing
- Patent Revenues
- Consulting Services



### • IPR Licensing Process

**Step-1:** Determining Intellectual Property: Selecting inventions with high commercial potential.

**Step-2:** Commercialization Strategy: Meeting with potential buyers and determining a licensing model

**Step-3:** Licensing Agreements: Signing revenue-sharing agreements with companies.

# Financial Sustainability and Revenue Models in Technology Transfer Offices

## Revenue Models and Fundraising Methods

### SERVICE REVENUES

- Intellectual Property Licensing
- **Patent Revenues**
- Consulting Services



### • Patent Income Process

**Step 1:** Focus on high-demand areas.

**Step 2:** Obtain international patent protection.

**Step 3:** Contact potential business partners and investors.

**Step 4:** Revenue-sharing or fixed-fee licensing agreements should be made.

# Financial Sustainability and Revenue Models in Technology Transfer Offices

## Revenue Models and Fundraising Methods

### SERVICE REVENUES

- Intellectual Property Licensing
- Patent Revenues
- **Consulting Services**

#### • Consulting Services Process

**Step 1:** It should be determined which technology or process the companies need.

**Step 2:** The scope, delivery times and goals of the consultancy service should be clarified.

**Step 3:** Report, analysis or training services should be provided in accordance with the determined needs.

**Step 4:** Hourly fee, a fixed project fee or performance-based income models should be applied in return for the service.

**Step 5:** Feedback and follow-up should be provided after the service.



# Financial Sustainability and Revenue Models in Technology Transfer Offices

## Revenue Models and Fundraising Methods

### PROJECT BASED INCOME

- **National Support Programs**
- International Support Programs



- **National Support Programs**

National support programs provide significant financial resources for entrepreneurs, researchers and technology developers. These programs were established to ensure the development of the local innovation ecosystem and to encourage research and development (R&D) activities.

# Financial Sustainability and Revenue Models in Technology Transfer Offices

## Revenue Models and Fundraising Methods

### PROJECT BASED INCOME

- National Support Programs
- **International Support Programs**



### • International Support Programs

- Horizon Europe
- EUREKA Programme
- Eurostars Program

# Financial Sustainability and Revenue Models in Technology Transfer Offices

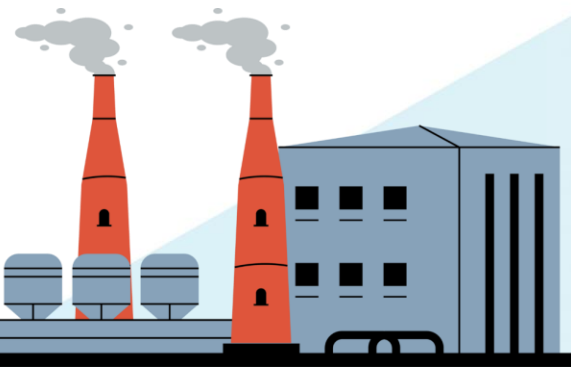
## Revenue Models and Fundraising Methods

### INDUSTRIAL COLLABORATIONS

- **Contracted R&D Projects**
- Technology Development & Prototyping
- Testing and Verification Services
- Technical Consultancy Services
- Joint Patent Development
- Training and Certificate Programmes

#### **Contracted R&D Projects:**

Contract R&D projects are one of the most common cooperation models between industry and TTOs. Companies invest in projects in cooperation with TTOs in order to solve a specific technological problem. In these projects, TTOs provide expertise in research and development processes. TTOs earn a certain amount of income from these contracts.



# Financial Sustainability and Revenue Models in Technology Transfer Offices

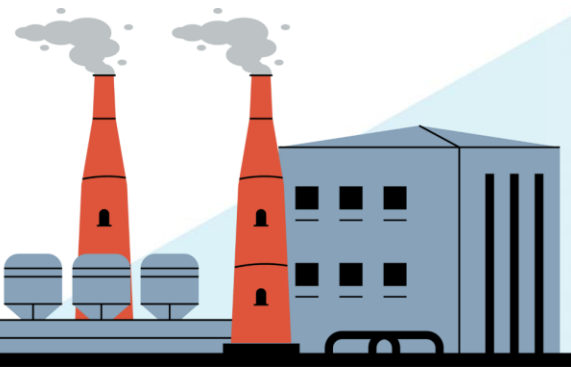
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### INDUSTRIAL COLLABORATIONS

- Contracted R&D Projects
- **Technology Development & Prototyping**
- Testing and Verification Services
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- Joint Patent Development
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#### Technology Development & Prototyping

Technology development and prototyping activities are an important source of income during the design phase of new products and processes. TTOs collaborate to develop technological solutions needed by the industry and prototypes are produced in this process.



# Financial Sustainability and Revenue Models in Technology Transfer Offices

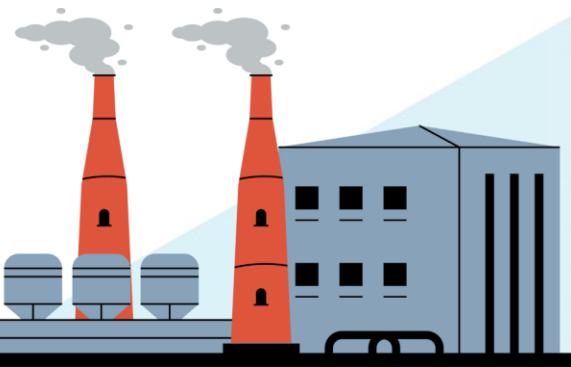
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### INDUSTRIAL COLLABORATIONS

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#### Testing and Verification Services

Testing and verification services for the industry gain importance especially in the evaluation phase of new products or technologies before they are introduced to the market. TTOs facilitate these processes by providing laboratory services and technological analyses to the industry.



# Financial Sustainability and Revenue Models in Technology Transfer Offices

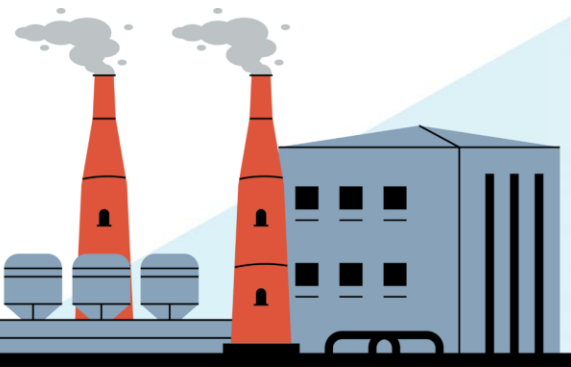
## Revenue Models and Fundraising Methods

### INDUSTRIAL COLLABORATIONS

- Contracted R&D Projects
- Technology Development & Prototyping
- Testing and Verification Services
- **Technical Consultancy Services**
- Joint Patent Development
- Training and Certificate Programmes

### Technical Consultancy Services

Technical consultancy provides important services to industry in areas such as R&D strategies, technology transfer and innovation management. TTOs provide consultancy services to industrial organisations on how to make their R&D processes more efficient, which technologies can yield better commercial results and how they can develop innovation strategies.



# Financial Sustainability and Revenue Models in Technology Transfer Offices

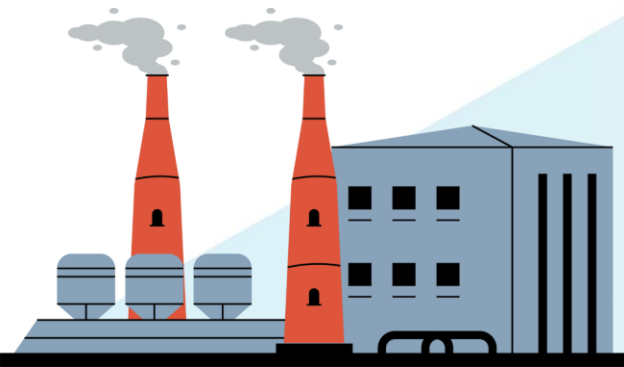
## Revenue Models and Fundraising Methods

### INDUSTRIAL COLLABORATIONS

- Contracted R&D Projects
- Technology Development & Prototyping
- Testing and Verification Services
- Technical Consultancy Services
- **Joint Patent Development**
- Training and Certificate Programmes

#### Joint Patent Development

Joint patent development is another revenue model arising from collaborations with industry. TTOs create intellectual property with the industry and these patents are then licensed and revenue is generated. Stanford University, one of the world's leading universities, develops joint patents with industry and earns significant revenues from the licensing of these patents. Such partnerships enable technology transfer offices to play an active role in



# Financial Sustainability and Revenue Models in Technology Transfer Offices

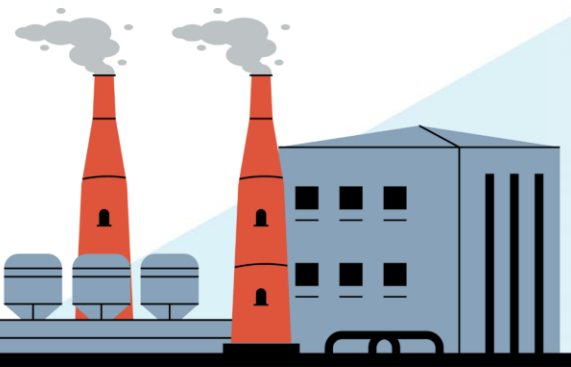
## Revenue Models and Fundraising Methods

### INDUSTRIAL COLLABORATIONS

- Contracted R&D Projects
- Technology Development & Prototyping
- Testing and Verification Services
- Technical Consultancy Services
- Joint Patent Development
- **Training and Certificate Programmes**

#### **Training and Certificate Programmes:**

Industry-specific training and certification programmes are another revenue model provided by TTOs. These trainings are organised to provide industrialists with information on the use of technology, innovation management and R&D processes. These trainings especially help to accelerate the adaptation processes of industrialists to new technologies.



# Financial Sustainability and Revenue Models in Technology Transfer Offices

## Revenue Models and Fundraising Methods

### SHARES AND EARNINGS FROM START-UP AND SPIN-OFF COMPANIES

- A TTO has the potential to generate long-term income **by acquiring shares** in the startups it supports. As the initiatives grow and achieve commercial success, the shares purchased by TTOs increase in value. This increase in value creates an important source of financial gain for the TTO.
- TTOs can accelerate investment processes by providing **mentoring and networking support** to entrepreneurs. It helps entrepreneurs to present more effectively in meetings with investors and introduces them to the right investors, enabling them to secure funding.



# Financial Sustainability and Revenue Models in Technology Transfer Offices

## Revenue Models and Fundraising Methods

### SHARES AND EARNINGS FROM START-UP AND SPIN-OFF COMPANIES

- **Getting a share of the commercial earnings** of a successful start-up is another important source of income for TTOs. If a start-up is successful and starts to grow commercially, a portion of the revenues generated from this success falls to TTOs. This model can provide TTOs with significant gains, especially in cases where investments in early-stage initiatives yield results.
- TTOs offer **entrepreneurship support programmes**, providing start-ups with training, consultancy and access to funding. These support programmes help entrepreneurs overcome the challenges they face in their business start-up process and provide them with the necessary tools.



# Financial Sustainability and Revenue Models in Technology Transfer Offices

## Revenue Models and Fundraising Methods

### OTHER INCOME SOURCES

- TTOs organize **training programs** and provide participants with in-depth information on topics such as entrepreneurship, technology management, intellectual property rights and project writing. These trainings provide basic information and skills so that entrepreneurs and industrial representatives can make their businesses more efficient and competitive. Training programs usually focus on a specific topic and provide participants with theoretical and practical information, which enables TTOs to generate income while contributing to the development of entrepreneurship.
- **Certificate and workshops** are other income models offered by TTOs. Such programs are organized for individuals or teams who want to gain more in-depth knowledge on certain topics, and participants are provided with a paid certificate and income is provided. Workshops are usually based on applied learning methods, and participants develop their own projects under the guidance of teachers. Such programs offer valuable opportunities, especially for those who are active in the business world, because they allow them to gain new skills in business



# Financial Sustainability and Revenue Models in Technology Transfer Offices

## Revenue Models and Fundraising Methods

### OTHER INCOME SOURCES

- **Mentoring services** are also an important source of income for TTOs. Mentoring processes not only provide entrepreneurs with business development strategies, but also help them build the right business models, conduct market research, manage their relationships with investors and manage their innovation processes.
- TTOs provide **consultancy services** in the fields of technology and innovation by bridging the gap between industry and universities. These consultancy services generally help universities to establish new collaborations by transferring their research and development capacity to industry. In addition, through these services, TTOs can provide special strategic consultancy, technology transfer and innovation management guidance to industrial companies.



# Financial Sustainability and Revenue Models in Technology Transfer Offices

## Revenue Models and Fundraising Methods

### OTHER INCOME SOURCES

- **Online trainings and webinars** are an important opportunity to provide additional funding to TTOs by reaching large audiences. Thanks to such digital platforms, TTOs can cross physical borders and offer trainings to global audiences.
- **Webinars** are an effective tool for sharing information on specific topics, introducing new technologies and discussing innovation processes. These online events provide an important networking and learning opportunity for entrepreneurs, researchers and industry representatives.



# Financial Sustainability and Revenue Models in Technology Transfer Offices

## Business Development and Growth Strategies

### Example ;

**Cambridge Enterprise**, the technology transfer office of Cambridge University, stands out with its multi-faceted commercialisation strategies in the 2022-2023 financial year.

- While ensuring the sustainability of innovation by investing £1.3 million in 301 patent applications and patent protection, the institution strengthened industry-academia collaborations by signing 170 commercial and research licence agreements.
- It also supported the transfer of research outputs into commercial applications with £7.9 million of 'translational funding'. In the field of consultancy, it expanded knowledge transfer by signing 441 agreements (with 325 different customers) and generated a total of £ 18.7 million in licence income from these activities.
- Supporting 2,399 researchers and keeping the academic ecosystem alive, Cambridge Enterprise demonstrates a scalable and sustainable model in technology transfer with this performance.

# Financial Sustainability and Revenue Models in Technology Transfer Offices

## Sample Financial Sustainability Models for TTOs

### Good Practice Examples From The World Tsinghua University

- Tsinghua University is a leading example of China's technology transfer ecosystem. Accredited as a national technology transfer center in 2001, the university has an industry cooperation committee and a science park to strengthen cooperation with industry.
- Tsinghua TTO manages the university's commercialization strategies through units related to intellectual property management, technology transfer, and legal processes. In addition, the university provides technology acquisition services for Chinese enterprises from international markets and technology licensing services for the Chinese market through the International Technology Center (ITTC), established in 2001.
- Tsinghua has also made significant investments through Tsinghua Holding, commercializing 56 key technologies and achieving significant advances in critical technologies. These diversified financial and commercialization strategies enable Tsinghua University to establish a successful technology

## **8. Evaluation and Impact Assessment: Teach methods to evaluate the long-term impact of technology transfer initiatives, both financially and socially.**

- Quality Management Systems in TTOs
- Monitoring TTO Processes and Performance
- Social Impact Assessment

# Evaluation and Impact Assessment: Teach methods to evaluate the long-term impact of technology transfer initiatives, both financially and socially.

## Quality Management Systems in TTOs

**ISO 9001 Quality Management Systems** is an international quality management system standard and was first introduced in 1987. This standard applies worldwide and allows organisations to certify their quality management systems. Currently, more than 1,000,000 organisations in 170 countries operate in accordance with ISO 9001 standards.



# Evaluation and Impact Assessment: Teach methods to evaluate the long-term impact of technology transfer initiatives, both financially and socially.

## Quality Management Systems in TTOs



### Benefits of ISO 9001 Quality Management System and other QMSs for TTOs

- **Efficiency and Process Improvement:** By standardising service processes, project management, intellectual property management and cooperation processes are carried out more effectively.
- **Error and Cost Reduction:** Quality management minimises errors that may occur in project processes and patent applications.
- **Legal Compliance:** TTOs more easily comply with legal regulations such as intellectual property rights, grants and support programmes.
- **Marketing and Competitiveness:** A TTO with an ISO 9001 certificate increases its corporate reliability and seizes more national and international cooperation opportunities.
- **Job Satisfaction and Motivation:** Clearly defined tasks and standardised processes make TTO employees more efficient and motivated.
- **Training and Development:** Training processes organised for academicians, entrepreneurs and industry collaborators become more effective.

# Evaluation and Impact Assessment: Teach methods to evaluate the long-term impact of technology transfer initiatives, both financially and socially.

## Quality Management Systems in TTOs



### Benefits of ISO 9001 Quality Management System and other QMSs for TTOs

- **Job Security:** It enables TTO employees to work safely in long-term sustainable projects and minimises risks in business processes.
- **Better Product and Service Quality:** Technological outputs arising from university-industry collaborations reach higher quality standards.
- **Customer Satisfaction:** Satisfaction is increased by addressing the expectations of researchers, entrepreneurs and industrial partners more systematically.
- **Better Communication:** Communication between academics, industry representatives and investors is made more efficient.
- **Reliable Business Partnership:** A TTO with quality management systems can receive more funding in projects and strengthen collaborations.

# Evaluation and Impact Assessment: Teach methods to evaluate the long-term impact of technology transfer initiatives, both financially and socially.

## Monitoring TTO Processes and Performance

What are the 'Performance and Success Criteria' for TTOs?

Performance Indicator	Measure of Success
Number of Participation	Number of participation in training and information events organised during the year.
Successfully Projected Support Programmes	Number of support programmes applied and accepted by the participating companies.
Grant and Funding Increase	The amount of funds and grants provided and the financial support provided to the business world.
Project Success Rate	Successful completion rate of the supported projects.
Training Content Activity	Increase in the level of knowledge of the business world on new technologies and R&D systems following training and information activities.
Number of Projects	Number of projects initiated and successfully carried out within the framework of university-industry co-operation.
Cooperation Agreements	Number of formal co-operation agreements between the university and industry.
Cooperation Potential	Number of new collaborations established with the business world as a result of training and promotion activities.

# Evaluation and Impact Assessment: Teach methods to evaluate the long-term impact of technology transfer initiatives, both financially and socially.

## Monitoring TTO Processes and Performance

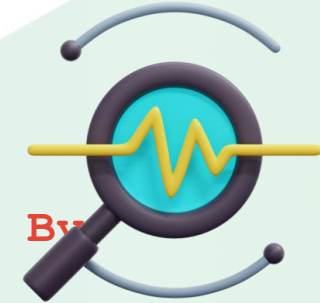
### What are the 'Performance and Success Criteria' for TTOs?

Performance Indicator	Measure of Success
Project Outputs	Innovations, patents and commercialisable products resulting from the projects carried out.
Patent and Licence Agreements	Number of patents obtained and licence agreements concluded within the framework of intellectual property management carried out by TTO.
Intellectual Property Commercialisation	Commercialisation rate of licensed intellectual property and revenues generated.
Effectiveness of Registration Processes	Speed and efficiency in the registration process of intellectual property.
New Initiatives	Number of new start-up companies established from R&D ideas carried out by academics, students or graduates. Number of mentorships and mentorship hours provided to these start-ups.
Investment Attraction Success	The investments received by the established enterprises and the economic value they bring to the business world.
Entrepreneurship Support Activities	The number of counselling and training services provided to academics, students or graduates and the entrepreneurial successes these services have led to.
Stakeholder Satisfaction	Satisfaction rate provided by the feedback received by TTO from

# Evaluation and Impact Assessment: Teach methods to evaluate the long-term impact of technology transfer initiatives, both financially and socially.

## Monitoring TTO Processes and Performance

### Regular Monitoring Of Tto Internal Processes And Their Evaluation By Stakeholders



- Regular monitoring of TTO internal processes increases efficiency and ensures that strategic goals are achieved. Monitoring of these processes is carried out with performance indicators and identifies areas for improvement. Feedback mechanisms are used for continuous improvement of processes.
- Regular reporting and monitoring strengthens internal management and transparent communication with external stakeholders. Early detection and management of risks facilitates achievement of targets. Monitoring of TTO internal processes identifies training and capacity building needs and supports the overall efficiency of the organisation.
- Improvements made as a result of stakeholders' evaluation of TTO activities increase the efficiency of processes and ensure organisational development.

# Evaluation and Impact Assessment: Teach methods to evaluate the long-term impact of technology transfer initiatives, both financially and socially.

## Social Impact Assessment



### Social Benefits Of Technology Transfer Activities

- The societal benefits of technology transfer activities make a significant contribution to improving the overall welfare and quality of life of society. These activities enable the development of innovative solutions, new business opportunities and more efficient production methods. Societal benefits help to spread technology more widely throughout society, leading to improvements in areas such as health, environment and education.
- Knowledge and innovations obtained through technology transfer contribute to solving social problems, sustainable development and environmentally friendly practices. Universities, industry and public organisations involved in technology transfer processes fulfil their social responsibilities through community-oriented projects and produce solutions to the needs of society.

# Evaluation and Impact Assessment: Teach methods to evaluate the long-term impact of technology transfer initiatives, both financially and socially.

## Social Impact Assessment



### Effects On Regional And National Development

- Technology transfer activities offer dynamics that directly affect regional and national development. The integration of innovative technologies into the local economy contributes to increasing labour capacity and economic growth. These processes encourage local entrepreneurship, create new jobs and increase regional competitiveness, especially in developing regions.
- At the national level, technology transfer supports economic diversification, strengthens high value-added production sectors and increases the country's global competitiveness. It can be said that this effect plays a role in supporting sustainable development in the long run and is an important tool in shaping national development strategies.

# Evaluation and Impact Assessment: Teach methods to evaluate the long-term impact of technology transfer initiatives, both financially and socially.

## Social Impact Assessment



### TTO Social Impact Assessment Method

#### Determination of Indicators (KPI Identification)

- Economic indicators: Patent licence revenues, number of start-ups, university-industry collaborations
- Social indicators: Social awareness activities, student and academic participation rates
- Innovation and technology indicators: Commercialised projects, start-up success rates, R&D investments

#### Data Collection and Measurement

- Quantitative methods: Surveys, statistical analyses, economic modelling
- Qualitative methods: Interviews, case studies, stakeholder feedback

# Evaluation and Impact Assessment: Teach methods to evaluate the long-term impact of technology transfer initiatives, both financially and socially.

## Social Impact Assessment



### TTO Social Impact Assessment Method

#### Comparative Analysis and International Benchmarking

- Regional comparisons: Performance evaluation between different TTOs within the same country
- International benchmarking: Comparative analysis with successful technology transfer offices (e.g. TTOs in Europe and the USA)

#### Reporting of Results and Strategic Recommendations

- Identifying weaknesses and developing suggestions for improvement
- Developing action plans for policy makers and universities

# Evaluation and Impact Assessment: Teach methods to evaluate the long-term impact of technology transfer initiatives, both financially and socially.

## Social Impact Assessment



### Social and Economic Impact of TTOs in Türkiye: Case Study

- The "**Evaluation of the Effectiveness of Technology Transfer Offices**" report published by the Ministry of Industry and Technology of the Republic of Türkiye in 2021 includes a comprehensive analysis of 63 Technology Transfer Offices (TTOs) in 28 cities across Türkiye. In the study, the contributions of TTOs to the provinces where they are located are detailed.
- According to the report, the areas where TTOs contribute the most are as follows: raising awareness and ecosystem formation, creating economic value with new projects, entrepreneurship, employment and new product development, creating clusters and actively participating in clusters.

# Evaluation and Impact Assessment: Teach methods to evaluate the long-term impact of technology transfer initiatives, both financially and socially.

## Social Impact Assessment



### TTO Social Impact Assessment Example

KPI (Key Performance Indicator)	Measurement Criteria	Results (2017-2018 Increase Rate)	Source
Patent and intellectual property applications	Annual number of applications	85% increase	Republic of Türkiye Ministry of Industry and Technology (2021, p. 5)
Number of TTO supported entrepreneurs	Participation in TTO programmes	63% increase	Republic of Türkiye Ministry of Industry and Technology (2021, p. 5)
Number of enterprises incorporated	Companies established through TTO	47% increase	Republic of Türkiye Ministry of Industry and Technology (2021, p. 5)
University-industry cooperation projects	Signed cooperation agreements	Increase observed	Republic of Türkiye Ministry of Industry and Technology (2021, p. 6)
Growth in the number of TTOs	Total number of TTOs in the	2 in 2000, 30 after 2012	Republic of Türkiye Ministry of Industry and

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