

A ROADMAP FOR LEBANESE UNIVERSITIES TO STRENGTHEN THEIR TECHNOLOGY TRANSFER CAPABILITIES

Outcome of the Consultancy Mission

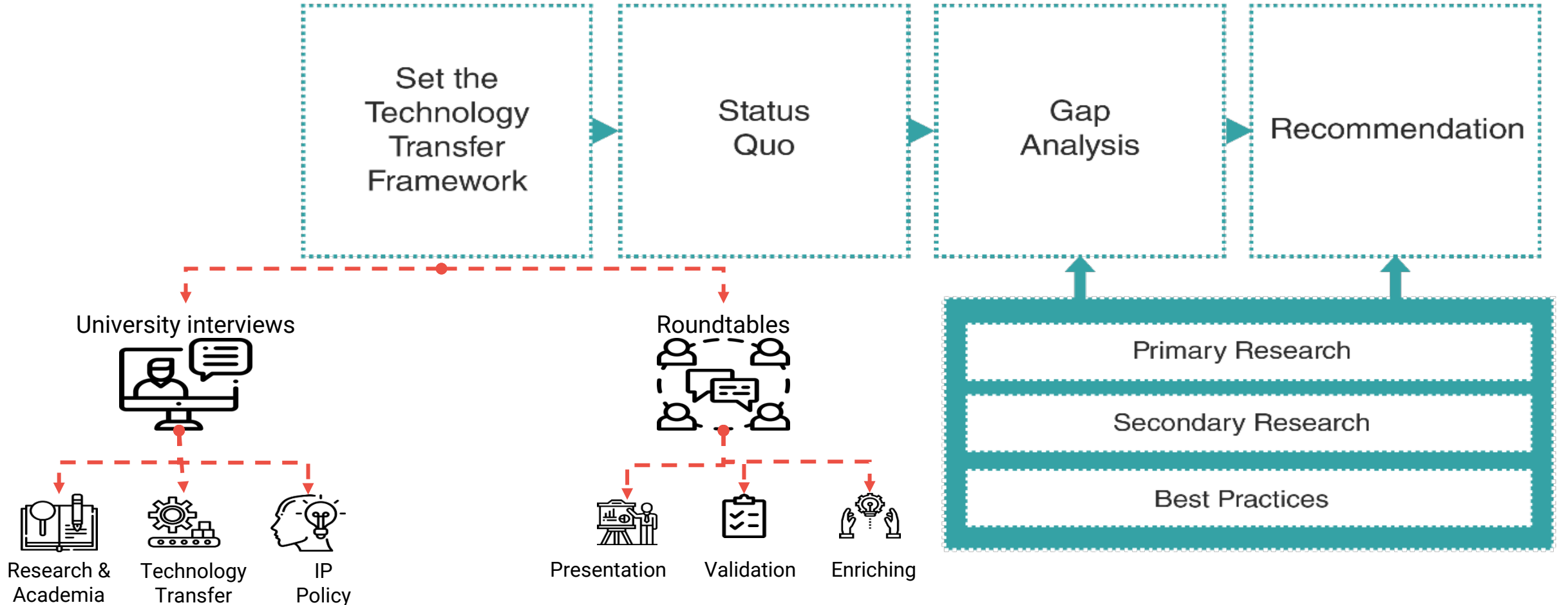
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CEO, Innovety

GOAL OF MISSION

Establish a solid technology transfer process at universities and give researchers the knowledge and tools to innovate and commercialize their research

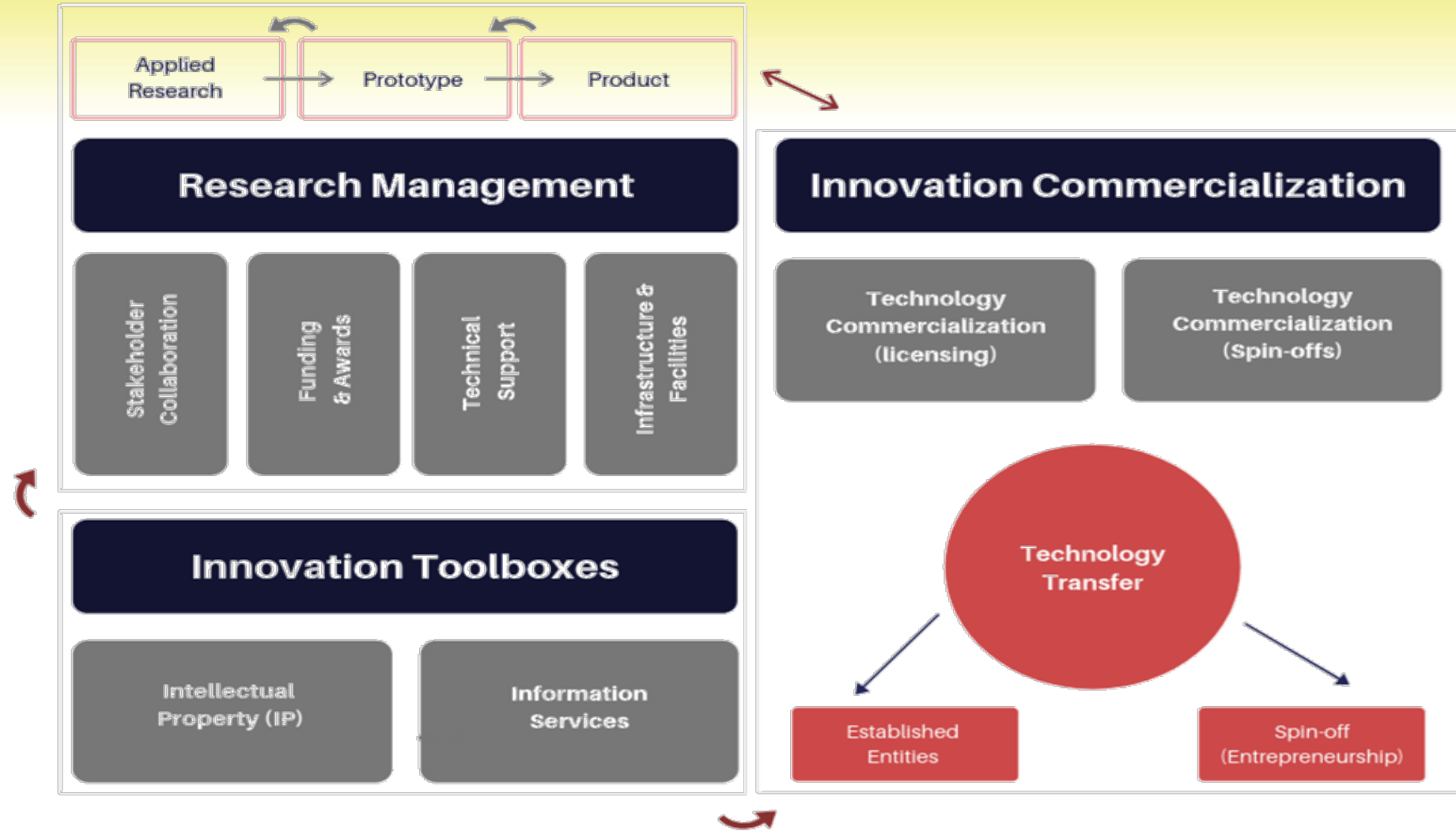


The Methodology



- No conflict with legislation: Aligned with Lebanese legislation and institutions' rules
- Internationalization: Exposing Lebanese innovators, researchers, entrepreneurs to international markets
- Utilizing existing resources: Easiness of fit and maximize efficiency
- Institutional sustainability: Define champion institutions to implement them
- Private-Public Partnership (PPP): Collaborations between the private and public sector is encouraged (public sector owned, and private sector managed)
- Stakeholders' maturity: Account for the entities' maturity

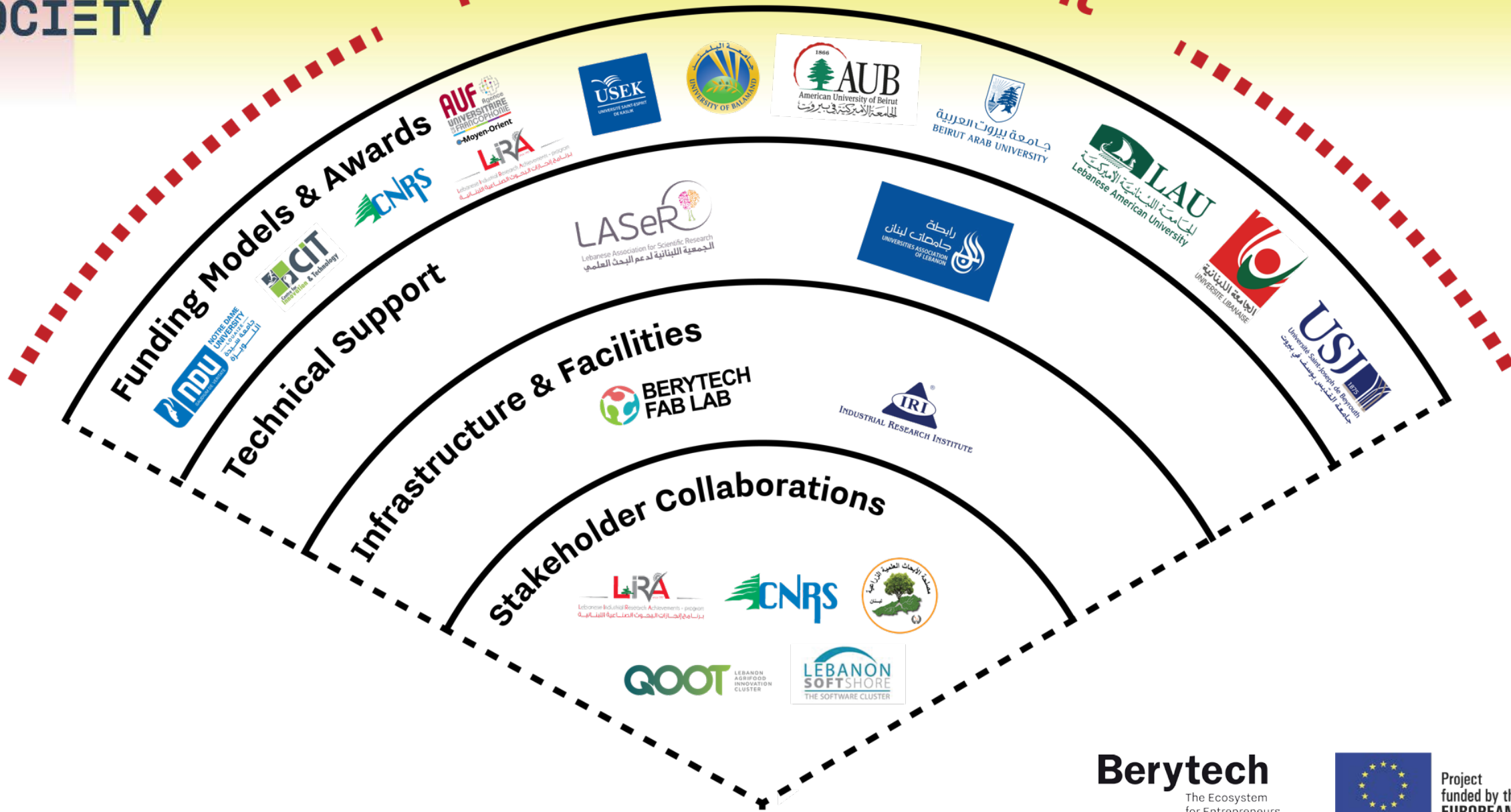
Technology Transfer Framework



Lebanon's Technology Transfer Ecosystem



Research Management



Research Management – Applied Research Grants



Agence Universitaire de la Francophonie (AUF)

A Lebanese-based global association of French higher education and research institutions. With 22 Lebanese members in the association, AUF provides its members with funding for research at these institutions. Funds available are targeted towards research and theses, collaborative projects, and financing researchers' attendance to relevant international trainings and events.











The National Council for Scientific Research (CNRS)

Collaboratively and independently funds research through the following programs: Grant Research Program (GRP) for full-time professors and PhD holders, International Projects, Doctoral Fellowships, as well as announces grant opportunities such as the EU Grants (PRIMA)



Lebanese Industrial Research Achievements Program (LIRA)

LIRA is a national program that aims to strengthen the cooperation taking place between industries and academic and research institutions. The industrial fund matches researchers with industries and covers 50% of the costs of two industrial research projects per university, with the other 50% covered by the industry

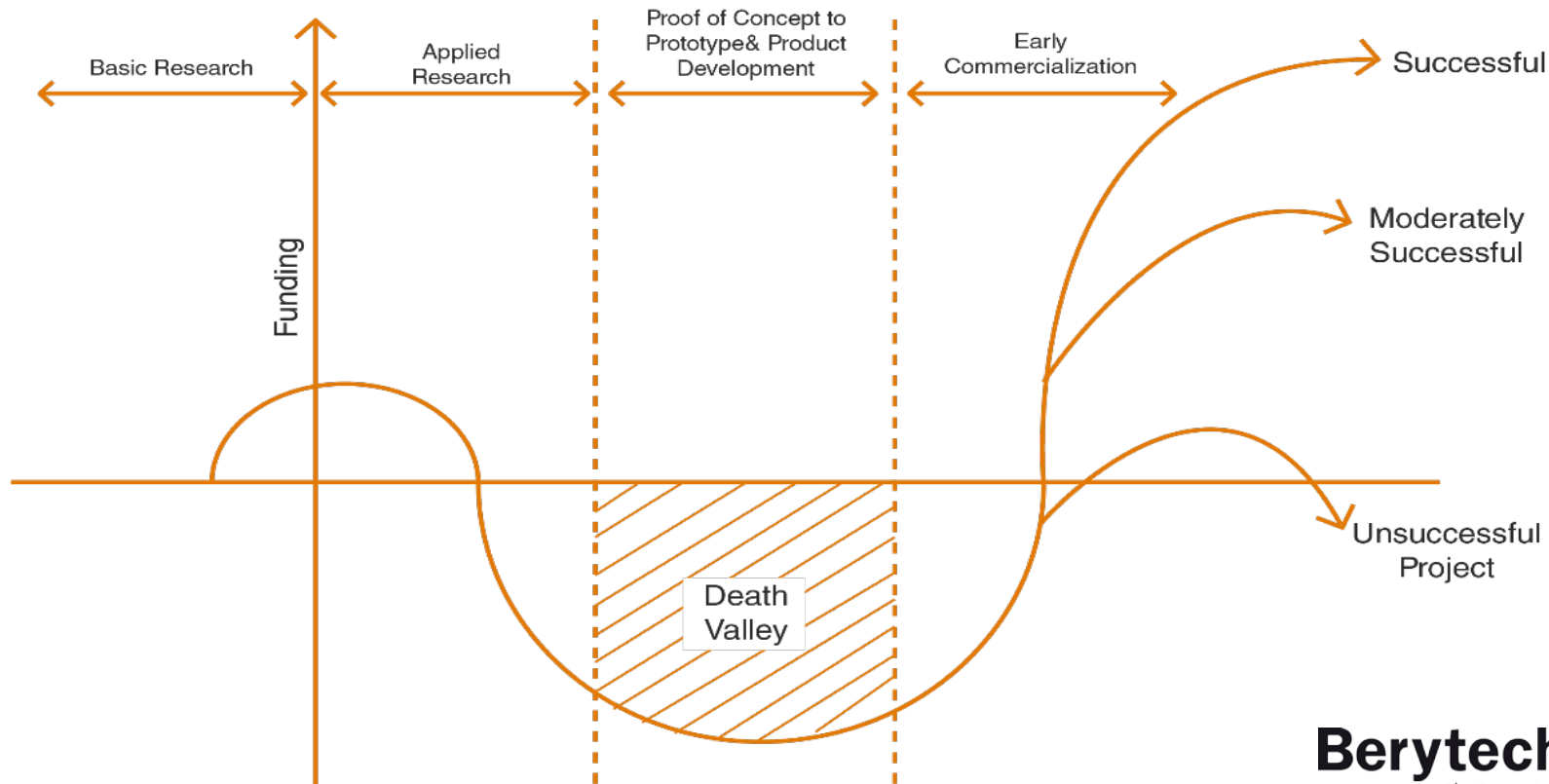
		Internal Funds	External Funds	Co-Funding
	American University of Beirut (AUB)	✓	✓	✓
	Lebanese University (UL)	✓		✓
	Lebanese American University (LAU)		✓	✓
	Beirut Arab University (BAU)	✓	✓	
	Notre Dame University (NDU)	✓	✓	
	University of Balamand (UoB)	✓		
	University of Saint Joseph (USJ)		✓	
	Holy Spirit University (USEK)	✓		✓

Research Management – Prototype & Product Development Grants



Center for
Innovation and
Technology (CIT)

The Innovation Vouchers aim to provide grants (\$6,000) to support innovative projects carried out by SMEs, independent researchers, research centers, and universities to carry out further R&D to their business models/prototypes.





Notre Dame
University – Louaize

The NDU Award for Distinction in Research recognizes faculty members who have presented exceptional achievements in research and creative activities. The award includes an honorarium and a research grant, a plaque, and a ceremony.



CNRS

Annual Research Excellence Award: for Lebanese researchers who carried out excellent scientific research projects.

The CNRS Excellence Career Award: for senior scientists who, through their career, contributed to the advancement of research in Lebanon in different scientific disciplines.



LIRA

Graduating Projects Prize: for 3 Bachelors' or Masters' students (and their supervising professors) whose projects demonstrate a high potential for implementation and are supported by a functional prototype.

Doctorate/Professional Projects Prize: for academic researchers and professionals who carried out innovative research projects that reflect a strong potential for industrial implementation that can be carried out in Lebanon. The projects must be supported by a functional prototype.

Research Management – Technical Support



Lebanese
Association for
Scientific Research
(LASeR)

An NGO that aims to support scientific research in different disciplines by encouraging researchers and scholars to develop the research ecosystem in Lebanon through capacity building for professors, students, researchers, exchange programs, scholarships, and other services.



Universities
Association of
Lebanon (UAOLB)

The representative entity of public and private universities in Lebanon whose aim is to develop strategies, policies and collaborative projects for research and higher education.

Industrial Research Institute (IRI)

An independent public institution headed by the Minister of Industry that is responsible for conducting industrial and scientific studies, research, testing, calibration, inspection and compliance with standards for products and individuals. Through the IRI membership, members can access analysis and testing labs at discounted prices and collaborate with third parties. The Institute provides training, consulting, and certification to labs at the national and regional level relevant to lab accreditation

Berytech Fab Lab

The Fab Lab offers a physical space that has different types of fabrication equipment, workshops, and mentorship in the areas of digital fabrication to students, researchers, and entrepreneurs.



Research Management – Collaborations

CNRS

The CNRS engages in multiple collaborative research projects with international and national academic and research institutions.



QOOT

Lebanon's first agri-food innovation cluster connects players from the entire value chain of the agri-foods industry nationally and internationally. Qoot aims to foster collaboration, strengthen linkages, and increase opportunities in the agri-food



Beirut
Research &
Innovation
Center

A private non-profit research center that supports the connection between international companies (majority Swiss companies), and researchers coming from different universities and institutions.



Lebanon
Softshore

The Lebanese software cluster managed by ELCIM and IRI is a group of Lebanese software companies that provide software services to international companies. Lebanon Softshore has created partnerships with universities such as NDU, USJ, and USEK as well as the Croatian software cluster.



Lebanese
Agriculture
Research
Institute

A governmental entity that specializes in conducting applied and basic scientific research for the development of the Lebanese agricultural sector in collaboration with researchers from various institutions, working closely with national farmers.

THE NEXT SOCIETY



Innovation Toolboxes – Intellectual Property



Industrial Research
Institute

The IRI provides workshops on topics related to intellectual property and technology transfer.



Ministry of Economy
and Trade

Ministry shares information about IP laws and regulations in Lebanon on its website. Additionally, there is a patent office in the ministry that works on registering of patents and IP.



Investment
Development Authority
of Lebanon

A section on IDAL's website is dedicated to educating innovators on topics such as how to protect IP, copyrights, trademarks, etc.

 Alyafi IP Group



IP Agents

IP agents share information about the necessary, high level steps, that a researcher needs to file for a patent, as well as other information about trademarks, copyright, etc. through their websites, workshops and trainings, as well as their advisory services.



AUB

The “Creative Research and Innovation” Center was their starting point for supporting graduate students in the process of spinning off through training and coaching them on IPR, how to connect with investors, how to develop a technical team, and more.



Technology
Transfer
Offices

The main player who considers or takes the role of TTOs in Lebanon is the AUB’s TTO, which is responsible for preparing, drafting and updating intellectual property policies and procedures, encouraging technology development, and assisting faculty in transferring technology to industry and others for the public benefit.



Innovation Toolboxes – Information Services



Ministry of Education
and Higher Education

Lebanese Ministry
of Education and
Higher Education

2 websites: One is for higher education and research with listings of universities and research centers, as well as information for high school students planning to pursue higher education.



AUB

Grants Office: provides its researchers with a listing of entities, both national and international, that have previously or are currently funding research projects at the university.

Library: guides that support and showcase the university's students and faculty, including a list of research centers and institutes in Lebanon and the Middle East as well as lists of awards and prizes



Lebanese Science Journal
المجلة العلمية اللبنانية

Lebanese Science
Journal

Open access journal by the National Council for Scientific Research (CNRS) that publishes research, reviews, and short communications



Universities

Most universities offer an online database of the research carried out within their premises, however the level of maturity and accuracy of the databases vary

Innovation Toolboxes – Information Services



Beirut Research
and Innovation
Center

BRIC publishes news about the research projects that it carries out including their latest projects, findings, and success stories.



SME Advisor
Middle East
(SME10x)

Through their website's "Technology" section, users can view the latest trends in technology, including breakthrough discoveries in science and technology, innovative uses of technologies, types of technologies, and the strengths and weaknesses of current technologies



Ministry of
Economy and
Trade

Through its website, users can:

- View all laws, regulations procedures, services, and relevant documents pertaining to intellectual property and its protection in Lebanon which includes patents, copyrights, trademarks, and industrial designs.
- Access information about different topics, forums, events, and entities that provide services that support SMEs' activities in Lebanon.



IRI

The IRI occasionally conducts workshops on intellectual property to increase awareness of IP among researchers and the university communities



World Intellectual
Property
Organization (WIPO)

A global organization concerned with intellectual property information and services. While some Lebanese IP laws are not compliant with international IP standards, the ecosystem can access the online information regarding Lebanese IP on their website.



Association of
Lebanon
Industrialists (ALI)

The ALI offers some services to individuals such as a quarterly newsletter of the latest meetings, news, and events related to the industrial sectors, a list of useful documents, and a list of important links that are mostly links to relevant ministries and government institutions.



UNESCWA

Carry out research and publish reports about the status of innovation and technology transfer in Lebanon and the Middle East and North African Region



IDAL

Displays through its website the government's highlighted sectors and allows users to view a fact book for each with key facts and figures relevant to each sector.



The Directory of Exports and Industrial Firms in Lebanon

Available online and in print, the directory shows industrial firms, their products, their HS codes, and service providers relevant to exporting, such as banks, insurance companies, transportation firms, and importers.



Zawya Middle East

A news source by Thomson Reuters that publishes articles, news pieces, and insights on the Middle East's economic, legal, financial situations, and news regarding specific industries in the Middle East and global markets.



Central Administration of Statistics (CAS)

A public administration that collects, processes, produces, and disseminates national social and economic statistics.

✦ wamda

MAGNITT SMEIO
arabnet

Online
Entrepreneurship
Magazines and
Platforms

These websites publish:

- News and success stories of entrepreneurs and their startups
- Reports and insights on trends and news in the ecosystems in the MENA region and internationally
- Databases of entities of the entrepreneurship ecosystem in MENA

 LAU
الجامعة اللبنانية الأميركية
Lebanese American University

LAU Newsletter and
Research News

Users may subscribe to the university's President's Dispatch newsletter or magazine (in print form or email) which also highlight the latest success stories of LAU's researchers

Innovation Commercialization

Berytech
The Ecosystem
for Entrepreneurs

USJ
Université Saint-Joseph de Beyrouth
جامعة القديس يوسف في بيروت

CNRS

Technology Transfer and commercialization (Spin-Offs)

AUB
American University of Beirut
الجامعة الأمريكية في بيروت

Technology Transfer and commercialization (Licensing)

LWAF
LEBANESE WOMEN ANGELO FUND

speed
D-BDO

Agrytech

KAFALAT SAL

SEEDERS

FLAT 6 LABS BEIRUT

TRIPOLI ENTREPRENEURS CLUB

LIRA
LEBANON INVESTMENT PROMOTION AGENCY
الوكالة اللبنانية لترويج الاستثمار

SMART ESA

BEIRUT DIGITAL DISTRICT

THOMSON REUTERS

BANQUE DU LIBAN

LIBERANDI TECH HUB

FOUNDATION DIANE
مؤسسة ديانة

BIAT

AUB
American University of Beirut
الجامعة الأمريكية في بيروت

IDAL
MAKASSI LEBANON

TECH CENTER

Berytech
The Ecosystem
for Entrepreneurs



National Council for Scientific Research

CNRS

Its main activities revolve around advising the government on any progress or issues to be made to the national science and technology policy, developing different programs linking private sector and academia for research, encouraging and easing the process of conducting scientific research, in addition to engaging in different research to support their initiative.



Technology
Transfer
Offices

The main role of technology transfer offices is to commercialize university inventions.

Berytech

Berytech

Among several initiatives at Berytech is its “from Research to Innovation” program supporting researchers in the fields of food, water, and energy to commercialize their products into market-ready ones.



Maroun N.
Chammas
Recognition Award
for Technology
Innovation

An award that recognizes the creators of innovative technological products in the fields of AI, VR/AR, 3D printing, cloud computing, robots, blockchain, genetic modification, renewable energy, cybersecurity, IoT, quantum computing, etc. The winners receive a monetary award.

KAFALAT S.A.L. Kafalat iSME

The iSME program by Kafalat also offers equity co-investments alongside another institutional investor such as a VC fund, holding companies, formal business angel groups and investment banks.



Fondation Diane

An NGO that focuses on the Lebanese environment. The NGO's initiative Viridis aims to support startups and SMEs in the green sector through technical support and mentorship as well as investing in them

Innovation Commercialization – Spinoffs

SEEDERS

Seeders

A program supported and managed by IM Capital which is a network of angel investors that connects early stage startups and entrepreneurs with potential investors for the opportunity to receive seed funds of up to \$100,000.



Lebanese
Women
Angel Fund
(LWAF)

A network of women angel investors that invest in early stage startups led by female entrepreneurs.

Berytech

Berytech

One of the largest entrepreneurship community and enabler in Lebanon. It offers incubation and acceleration programs, office spaces, facilities, workshops, events, competitions, mentoring, access to international markets, funding, advice and counseling, job opportunities, etc.

Innovation Commercialization – Spinoffs

KAFALAT S.A.L.

Kafalat Loans

Subsidized bank loans (up to 4.5%) that are guaranteed by Kafalat that are offered to SMEs in Industry, agriculture, tourism, traditional crafts, or high technology



Banque du Liban

Subsidized bank loans to SMEs.



Agrytech

An agri-food innovation hub that offers an incubation program to support entrepreneurs with innovative ideas that utilize technology or engineering to solve a challenge in the agri-food industry.

Innovation Commercialization – Spinoffs



Asher Center

Entrepreneurship center in USEK that supports entrepreneurship activities on campus through services such as acceleration, coworking space, idea validation, talks, workshops, etc.



THOMSON REUTERS

Thomson Reuters
SME Accelerator

Provides support to SME's through their accelerator.



Speed

A startup accelerator that supports early-stage technology startups working on developing software and providing digital solutions who are eventually aiming to target global markets.



Flat6Labs Beirut

An accelerator that offers seed funding, 4 months of mentorship with focused training from industry experts, over \$300,000 in benefits, legal support, office space, and networking exposure in exchange for minor equity in the company.

Innovation Commercialization – Spinoffs



Smart ESA

ESA Business School-based accelerator that provides startups with five acceleration programs tailored to their different needs.



Tripoli
Entrepreneurs'
Club

TEC offers a pre-accelerator program called the Startup Seeds



AUB

TTU: supports faculty and students in assessing their options for commercializing their technologies and in transferring their them to industries and for public benefit

Maroun Semaan Faculty of Engineering and Architecture (MSFEA): provide activities to engage aspiring entrepreneurs such as yearly hackathons, enrollment in design and entrepreneurship courses, internships, incubation, and final year project acceleration



Ministry of
Economy and
Trade

Has the Patent Protection and Trademarks Registration department and economic cooperation programs with the EU. These include “The Lebanese Excellence Award”, the establishment of incubators in different regions of Lebanon; and the supervision of an “electronic portal” to communicate with all stakeholders in Lebanon.



BIAT

A not-for-profit incubator and business development center implemented in collaboration with the Ministry of Economy and Trade, to support entrepreneurs and startups in the fields of: Tourism, agriculture, IT, crafts, industry. Their services include financial, technical, marketing, accounting, training, and networking support. Their two main branches are in Tripoli and Akkar



IDAL

The Business Support Unit (BSU) in IDAL is a unit dedicated to startup support needing any information establishing and running their business. The BSU provides eligible startups with market information, free legal and tax/accounting advice, and licensing support.



LIRA

In 2016, LIRA launched a fund that aims to support industrial-targeting research projects, to encourage innovation for industry. It is basically a transfer of academic projects that seek to address industrial issues. In addition to funding, LIRA offers facilities and services for international patent filing of highly valuable breakthroughs, be it in new products, or process and production technologies.



BDD

A center of entrepreneurship and innovation that offers working spaces and offices, hosts events, organizes talks, workshops, programs. In addition, BDD offers auditing, financial consulting, and HR services at reduced prices and supports startups with legalities and logistics.

Summary of Gaps at Universities

Limited Funding for Prototypes and Go-to-market

Most funds are directed to applied research, with limited numbers targeting the stages of prototype & product development, as well as go-to-market support

Limited Market Pull Models

Limited ability to connect between university research and market needs – disconnect in mapping internal technology needs and addressing needs / business opportunities in industrial value chains

Limited Curricula on Innovation and Commercialization

Limited university courses that are cross-listed between engineering/science and business schools, as well as not infusing enough concepts of management of technology in existing technology courses

Absence of IP policy in most universities & its dissemination

Most universities either have no IP policy in place or are not effectively communicating available ones to the research community and industry

Disconnect from Diaspora

Lebanon has a large diaspora that is not being capitalized on. They are not documented or tracked where they do business, limited channels to connect exist, and the opportunity to develop business opportunities with them remain limited.

Limited existence of Technology Transfer / matchmaking structures. Staff require training & coaching

Most universities do not any form of technology transfer (TT) and matchmaking structures with industry. TT personnel require technical, personal and business skills.

Limited incubation / acceleration programs with an international and research-dominated focus

Lebanon has a relatively small market. Incubation programs must focus on regional and international markets, as well as paying more attention to research-based entrepreneurs

Limited Information sources

In general, there is limited technology and market reports, Intellectual Property information, and documentation of success stories

Limited collaboration between universities and industry

While there are a number of platforms that do exist, more effort needs to be done in terms of establishing formal channels and models that allow inter and intra collaboration

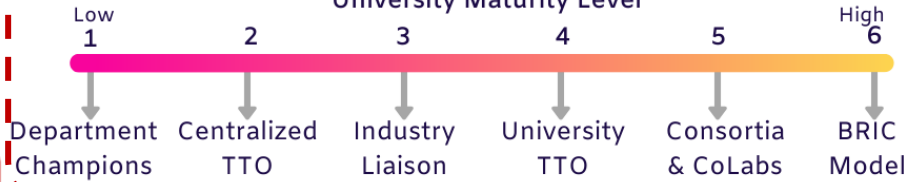
University Roadmap

TOP DOWN

License/Sell

A. Implementing Bodies

University Maturity Level



B. Planning

Create a database of stakeholders inside and outside of Lebanon and categorize based on the strength of connection between the university and said stakeholders

Identify:

- **Quick Wins:** Entities and individuals that the university is in present or constant contact with (e.g.: Alumni, students, faculty, existing partners, etc.)
- **Medium-term targets:** Reconnecting with entities and individuals that the university had connections with
- **Long-term targets:** establishing new connections with new entities (e.g.: Companies with clear challenges in the university's strong area of expertise)

C. Technology Transfer Activities

1. Internal Mapping

2. External Mapping

Y-Axis:

- Schools/Departments
- Research Centers
- Areas of research

Y-Axis:

- Departments & Centers
- Projects, Research, IP
- Value chains

X-Axis:

Output

A database of all existing IP, applied research, and final year projects

X-Axis:

Output

Potential business models for each technology mapped to each segment of the value chain

3. Licensing/Selling of Technologies

No IP Policy

1. Work on a Case-by-Case basis for IP contract negotiation
2. Establish an internal IP Policy:
 - Ownership
 - Royalty Sharing
 - Conflict of Interest
 - Obligations of Faculty
 - Forms and Agreements

IP Policy

1. IP Awareness and dissemination to new and existing students and faculty
2. Create IP database

D. Financing Activities

- Indirect costs of research
- Research and innovation funds
- Generating revenues

E. Adjacent Activities

Expanding Networks:

- Attending & organizing conferences/seminars
- Connecting via middlemen & 1-on-1 meetings
- Industry-University meetups

Communication:

- Maintain communication with existing networks
- Promoting TTO's services

Grants Information & Collaboration Office (GICO) Services

Go-to-Market Final Stage

Promoting the success stories, once at least one or two projects have been commercialized through university networks, and digital channels, signaling that the university is strongly ready to connect with industry

Spin-offs

Incentivize students and faculty to spin-off technologies through:

- Competitions
- Merit-based awards
- For-credit industrial internships
- Cross-listed entrepreneurship courses

Promote the external incubation of university spin-offs:

- Promote external incubation programs
- Scout for innovative commerciable technologies
- Invite external incubators and accelerators to university seminars and events
- Establish research-based incubation tracks in partnership with external incubators
- Match the universities' technologies with high-priority challenges domestically and internationally

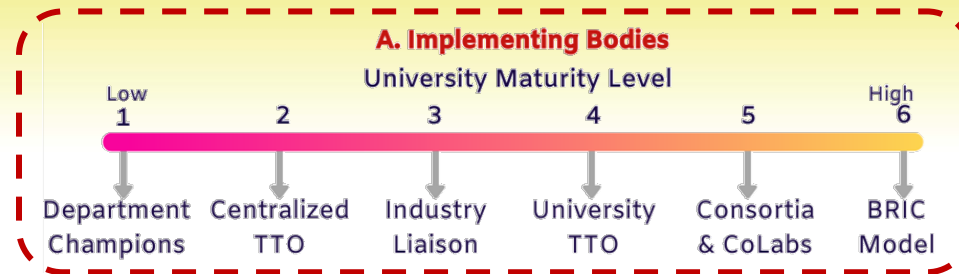
Establish a university-based incubator for promising technologies and projects through offering:

- Consultancy services
- Access to tools and resources
- Networking and connecting to other businesses and/or professionals

The incubator may focus on international markets through:

- Identifying technologies and business models with high potential in international markets
- Networking with international entities with the purpose of licensing and/or selling spinoffs
- Collaborating with international entities

University Roadmap

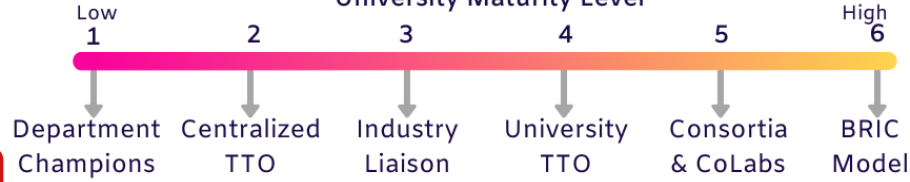


Matchmaking activities are to be carried out by different entities based on the university's maturity level in commercialization:

1. **Department Champions:** Assigning one champion from each department whose role is to identify commercializable technologies developed by their departments' students, researchers, and faculty members and support them with commercializing them through connecting them to industry players.
2. **Creating a Centralized TTO:** This can be done collaboratively between multiple universities and/or other entities (Research institutions, CNRS, etc)
3. **Industry liaisons:** Professionals/entities external to the university with experience in the industries whose role is to be the focal point between universities and industries/ national and regional projects to formulate partnerships with them. The industry liaison would engage in networking opportunities and events for researchers, prepare them for engaging with potential investors, inform them about the latest market needs, as well as offer potential collaboration opportunities.
4. **Establishing a university-based TTO**
5. **Consortia and CoLabs:** that encompass academic and research institutions, private sector, social organizations, service providers, government organizations, etc. to jointly carry out R&D projects and share resources. One or two consortia may be established first, to act as pilot programs in Lebanon in priority sectors that are to be followed by others in the future. The 'Collaborative Labs' model; non-profit private association or company (Univ. + private sector + research unit)
6. **Establishing a decentralized BRIC-like entity:** that manages activities between international companies and researchers

A. Implementing Bodies

University Maturity Level



C. Technology Transfer Activities

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Spin-offs

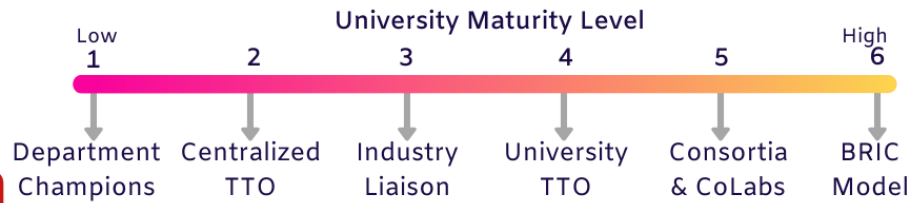
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- Establish a university-based incubator for promising technologies and projects through offering:
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- The incubator may focus on international markets through:
- Identifying technologies and business models with high potential in international markets
 - Networking with international entities with the purpose of licensing and/or selling spinoffs
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A. Implementing Bodies



B. Planning

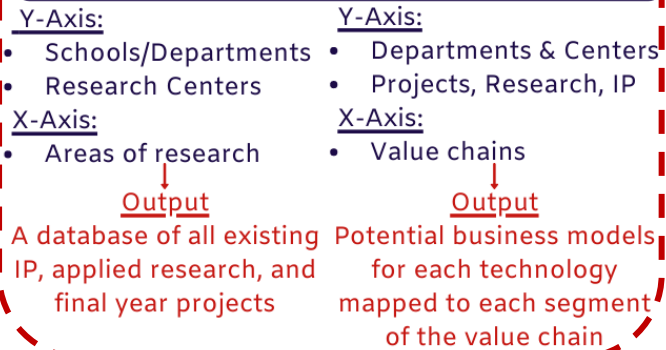
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- Value chains

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A database of all existing IP, applied research, and final year projects

Output

Potential business models for each technology mapped to each segment of the value chain

Step One:

Internal Mapping: Universities will identify their different departments and research centers (Y-axis) and match them to the technologies, projects, and IP across different areas of research (X-axis)

Step Two:

External Mapping: Identify various business models for each identified technology or project and their applications mapped to the industries' value chains on the X-axis.

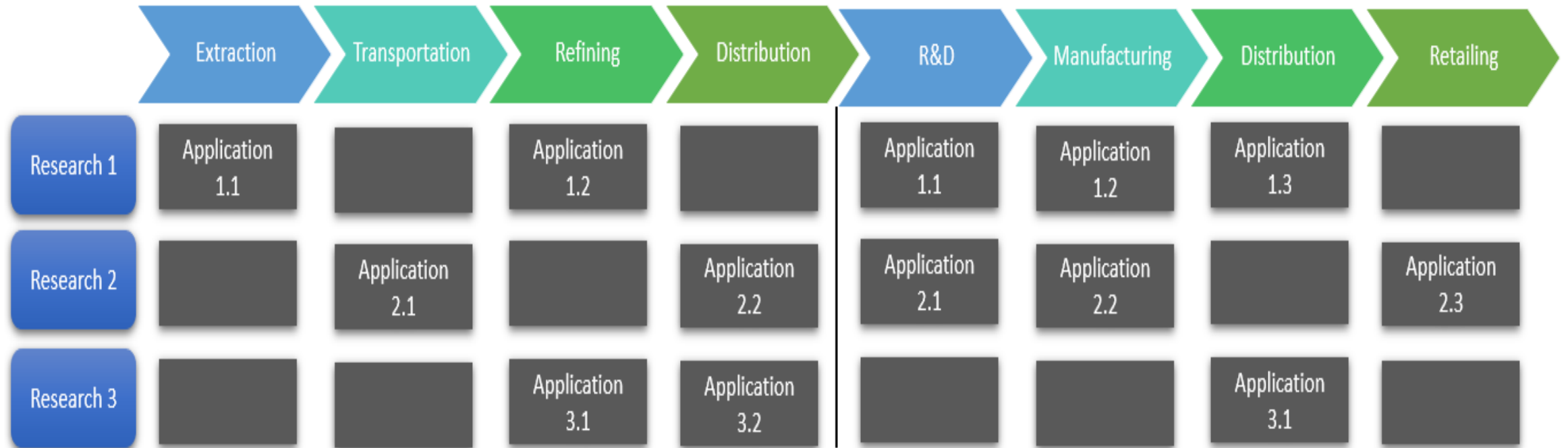
University Roadmap

Energy Industry

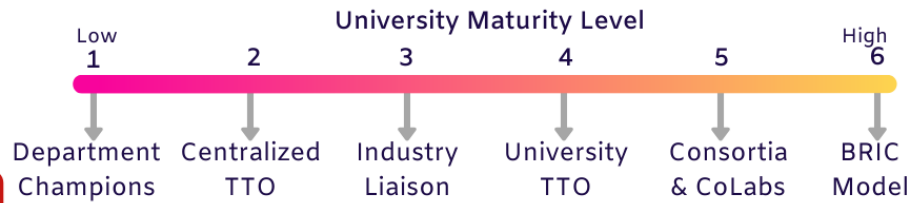
Crude Oil Value Chain

Industry 2

Value Chain 2



A. Implementing Bodies



B. Planning

Create a database of stakeholders inside and outside of Lebanon and categorize based on the strength of connection between the university and said stakeholders

Identify:

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C. Technology Transfer Activities

1. Internal Mapping 2. External Mapping

- Y-Axis:
- Schools/Departments
 - Research Centers
- X-Axis:
- Areas of research
- Y-Axis:
- Departments & Centers
 - Projects, Research, IP
- X-Axis:
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3. Licensing/Selling of Technologies

- No IP Policy**
1. Work on a Case-by-Case basis for IP contract negotiation
 2. Establish an internal IP Policy:
 - Ownership
 - Royalty Sharing
 - Conflict of Interest
 - Obligations of Faculty
 - Forms and Agreements
- IP Policy**
1. IP Awareness and dissemination to new and existing students and faculty
 2. Create IP database

D. Financing Activities

- Indirect costs of research
- Research and innovation funds
- Generating revenues

E. Adjacent Activities

Expanding Networks:

- Attending & organizing conferences/seminars
- Connecting via middlemen & 1-on-1 meetings
- Industry-University meetups

Communication:

- Maintain communication with existing networks
- Promoting TTO's services

Grants Information & Collaboration Office (GICO) Services

Go-to-Market Final Stage

Promoting the success stories, once at least one or two projects have been commercialized through university networks, and digital channels, signaling that the university is strongly ready to connect with industry

Spin-offs

Incentivize students and faculty to spin-off technologies through:

- Competitions
- Merit-based awards
- For-credit industrial internships
- Cross-listed entrepreneurship courses

Promote the external incubation of university spin-offs:

- Promote external incubation programs
- Scout for innovative commercial technologies
- Invite external incubators and accelerators to university seminars and events
- Establish research-based incubation tracks in partnership with external incubators
- Match the universities' technologies with high-priority challenges domestically and internationally

Establish a university-based incubator for promising technologies and projects through offering:

- Consultancy services
- Access to tools and resources
- Networking and connecting to other businesses and/or professionals

The incubator may focus on international markets through:

- Identifying technologies and business models with high potential in international markets
- Networking with international entities with the purpose of licensing and/or selling spinoffs
- Collaborating with international entities

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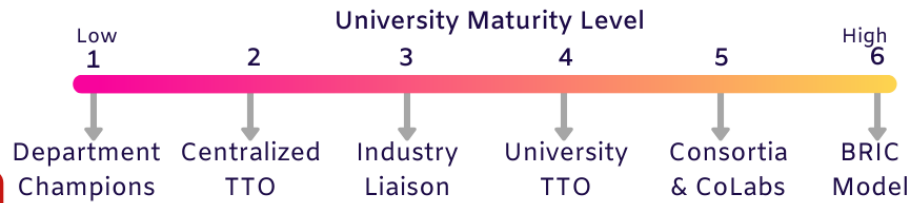
University with No IP Policy

Negotiation occurs on a case-by-case basis. University packages licensed end products in a more attractive way to industry. This involves packaging quality research output, with IP protected results, with any valuable intellectual assets (know-how, confidential information, contacts, relationships, market advantage), and selling them and negotiating mutually satisfying royalty sharing, and overall IP terms.

University with IP Policy or Aspiring Universities

The policies that should be covered include IP ownership, Invention Evaluation, Technology Commercialization, Conflict of interest, obligations of faculty, and forms and agreements.

A. Implementing Bodies



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C. Technology Transfer Activities

1. Internal Mapping

Y-Axis:

- Schools/Departments
- Research Centers
- Areas of research

Output

A database of all existing IP, applied research, and final year projects

2. External Mapping

Y-Axis:

- Departments & Centers
- Projects, Research, IP
- Value chains

Output

Potential business models for each technology mapped to each segment of the value chain

3. Licensing/Selling of Technologies

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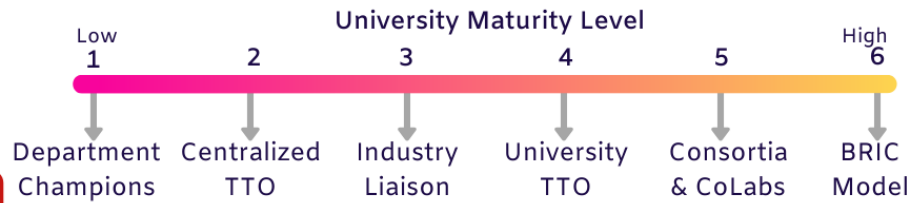
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D. Financing Activities

- Indirect costs of research
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- Generating revenues

- **Financing the establishment of a TTO through dedicating part of research funds (5-10% indirect costs)** to finance the establishment of a TTO
- Applying for local and international **innovation funds from the USAID, European Commission, etc.**
- Generating **revenues** from services (e.g., support industry in IPR management, workshop delivery, etc.)

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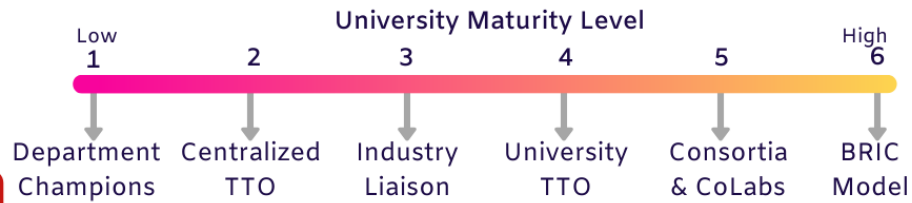
Communication:

- Maintain communication with existing networks
- Promoting TTO's services

Grants Information & Collaboration Office (GICO) Services

- GICO services coupled with TTO services
- Organizing and sponsoring events, competitions, seminars, workshops, and meet-ups for students, researchers, faculty, industry players, service providers, incubators, innovation and IP experts, investors, government officials, and the general public to discuss different technology management topics, share thoughts and expertise.
- Establishing a program for undergraduate students to conduct research under the guidance and supervision of faculty members, postdoctoral fellows, and graduate students during the winter or summer breaks.
- Promote TTO services internally and externally

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- Research Centers

X-Axis:

- Areas of research

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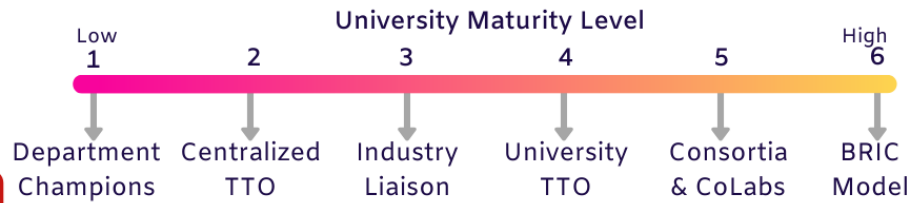
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University Roadmap

- **Annual award** to recognize the achievements of researchers in universities. The award may be in the form of: **Monetary or In-kind prizes, Honorary awards, Recognition, or Patent Funds.**
- **Research-based spinoff program:** Researchers are to be **matched with other participants** who do not have a technology to build teams. The teams will **receive mentorship** and work to **find applications for their technologies**, carry out **market research**, and develop **business plans**. By the end of the program, they will pitch their ideas to a panel of professionals from academia and industry. Winning teams will receive **seed funds, referrals to incubators, or in-kind grants.**
- Offering **cross-listed courses on entrepreneurship and technology and innovation management.** This can help universities foster and E&I culture and attract more research funds and the best researchers.

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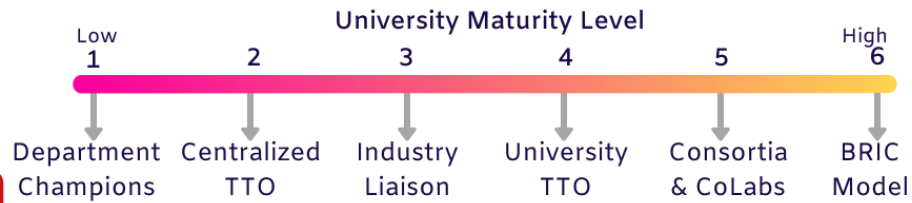
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Promote the incubation of university spin-offs:

- Promote incubation programs
- Scout for innovative commercializable technologies
- Invite incubators and accelerators to university seminars and events
- Establish relevant incubation tracks in partnership with local incubators
- Match the universities' technologies with high-priority challenges domestically and internationally

- Collaborate with existing incubators/accelerators and other service providers to create a **researcher-oriented incubation program to promote more research-based spin-offs**. Universities can support in the following activities:
 - **Promoting the incubation programs** in their communities
 - **Scout for innovative technologies that have commercial potential** among students, researchers, and university staff
 - Connecting startups to **international networks** and professionals for **funding, commercialization, and collaboration opportunities**
 - Facilitate startups' **access to their laboratories at other universities** and research institutions
 - Matching the universities' technologies with **high-priority challenges domestically and internationally**

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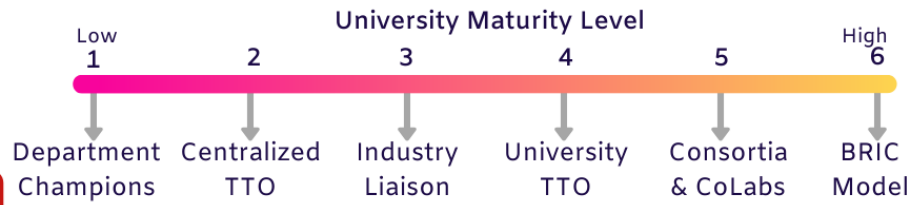
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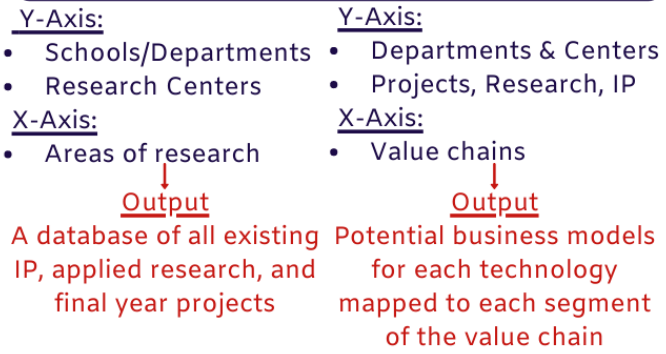
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- Frequently update websites and provide accurate and extensive information about all activities taking place on campus on:
 - Funding and grants available for research, prototyping, including relevant information such as amounts granted, requirements, eligibility, selection criteria, etc.
 - Completed or ongoing projects and programs
 - Contact information and areas of expertise of all faculty members
- Establishing a weekly and semi-annual newsletter that announces:
 - Success stories of the university's researchers, students, faculty, alumni, administration on topics related to research, innovations and breakthroughs, commercialization, spinoff creation, etc.
 - Events and programs

ENABLING ACTIVITIES

I. Information Services

- Publicizing of projects that have been commercialized to signal that the university is ready to connect with industry
- Promoting success stories of researchers, students, faculty, alumni, and administration pertaining to innovations and commercialization
- Provide accurate and extensive information about:
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 - Programs, seminars, and other events (future and past)

Communication Tools

Frequently updating and upgrading the university's website

Establishing a periodical newsletter

Social media campaigns

Internal and public campaigns

II. Networking and Communications

Arrange internal round-tables, meet-ups, and seminars organized and attended by:

- TTO personnel
- University management
- Alumni office
- Career office
- Heads of departments
- Professors

Attending external round-tables, workshops, seminars, and talks, creating a database of available contacts, and communicating with entities and individuals through newsletters and media plans to maintain communication with existing connections such as:

- Alumni
- Existing and previous faculty members
- Entities previously collaborated with

III. Collaborations and Partnerships

Collaboratively create a platform with other universities and research institutions that enables the open accessibility of the wide variety of facilities and laboratories. This allows for:

- Facilitating researchers' access to appropriate prototyping and testing tools
- Allowing outsiders to use facilities in exchange for a nominal fee (financially sustainable)

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 - Programs, seminars, and other events (future and past)

II. Networking and Communications

Arrange internal round-tables, meet-ups, and seminars organized and attended by:

- TTO personnel
- University management
- Alumni office
- Career office
- Heads of departments
- Professors

Attending external round-tables, workshops, seminars, and talks, creating a database of available contacts, and communicating with entities and individuals through newsletters and media plans to maintain communication with existing connections such as:

- Alumni
- Existing and previous faculty members
- Entities previously collaborated with



BOTTOM UP

Exchange Programs

Collaboratively carry out applied research projects with top international universities in their common area of concentration. This can be done through fully-funded exchange programs, whereby students receive a full scholarship to complete their PhD program abroad, or for students to participate in an exchange program for a year in their university of choice as part of the program's network

Entrepreneurship & Technology Commercialization Courses & Activities

- Introducing cross-listed entrepreneurship, and innovation management courses to science, technology, and engineering majors
- Extracurricular activities that engage students in technology commercialization and innovation challenges, especially researchers beyond academia
- Creating for-credit startup internships

Startup Bootcamp

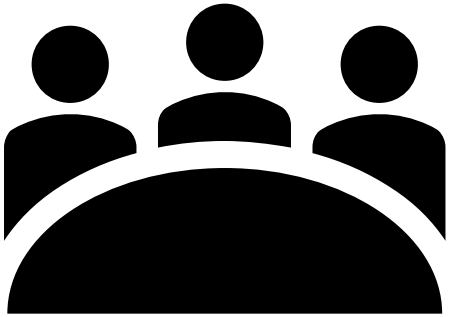
Engage students in biannual startup bootcamps designed specifically for researchers who have limited knowledge about entrepreneurship, but would like to spin-off their research through:

- Capacity building
- Mentorship
- Matchmaking
- Networking

Senior Management Support

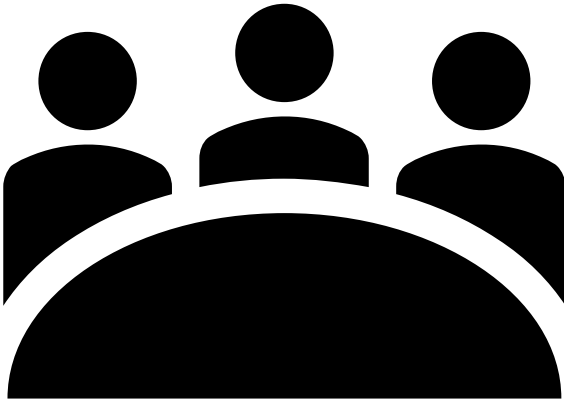
- Increasing the awareness of senior management of the latest technology transfer practices through organizing executive seminars inviting top management
- Professors can contribute in the development of researchers in different informal and formal ways
 - Connecting them to their personal networks for funding and collaboration opportunities
 - Providing them with financial support
 - Recruit them in their personal projects and businesses

Role of Government



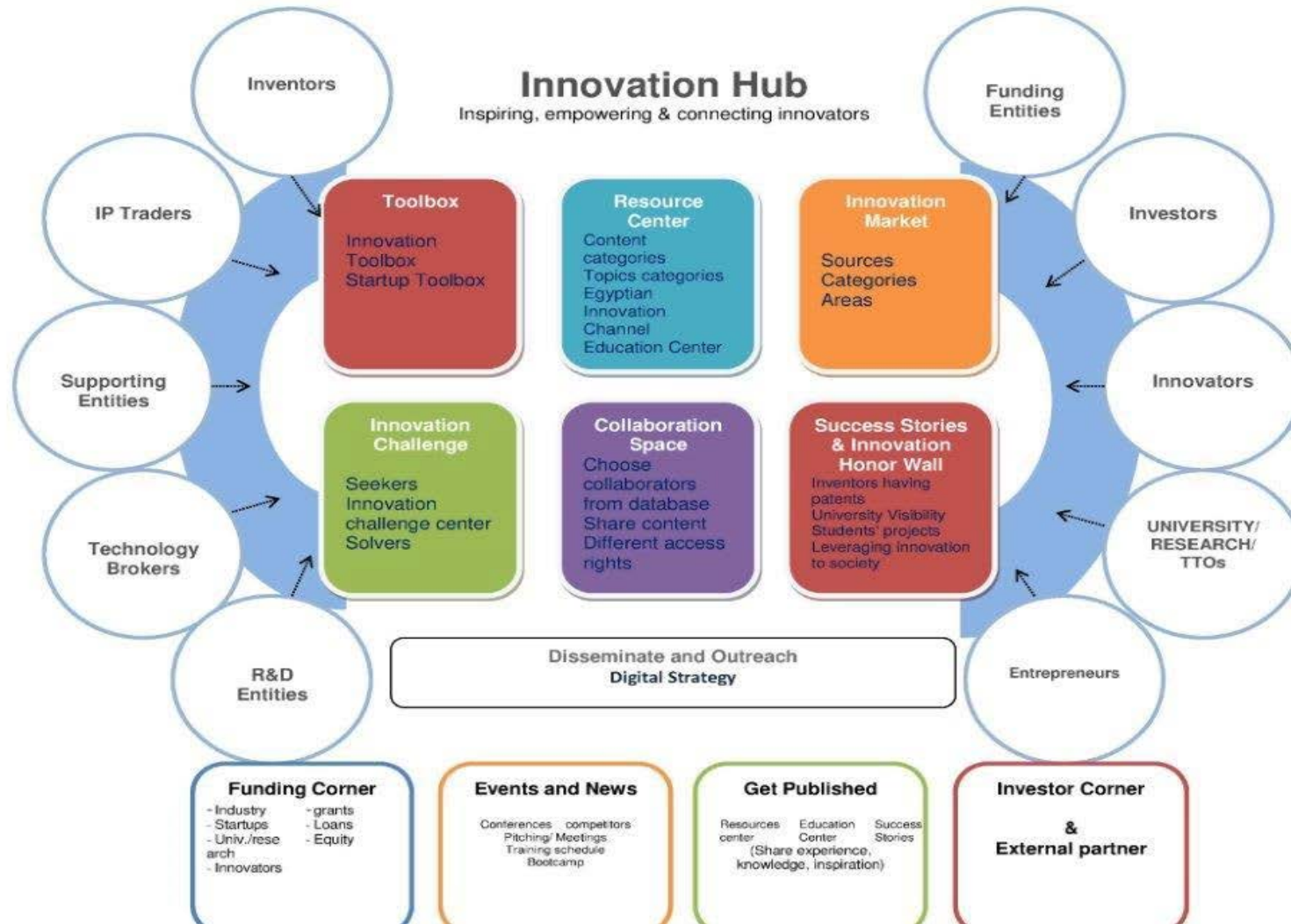
- Registering the LIRA Program into an Independent Legal Entity in order to scale
- Funding and Encouraging Applied Research through:
 - Basic-to-Applied Research Grants: funding predominantly basic research projects with the purpose of developing them into applied research-oriented projects
 - Prototype and Go-to-Market Funds: to allow researchers and private businesses to transfer prototypes or laboratory specimens.
 - International Research Grants: Funding students to carry out collaborative research internationally or attend relevant workshops and events. Many countries such as France, UK, Japan would be happy to offer such research grants (solely funded or co-funded)
 - Diaspora Researchers Fund: Inviting and funding Lebanese researchers and professionals in the diaspora to support domestic research projects.
 - National Research Awards: recognize the achievements of researchers in universities, research centers, and the private sector who have completed projects and provide them with monetary and honorary awards.
- Supporting in the Establishment of a Decentralized Entity to carry out and manage activities between international companies and local researchers - Similar to BRIC. We need to see more entities like BRIC in Lebanon.
- Many startups have legal issues that either require them to ignore – hence affecting their business or paying the big bucks to expensive legal firms. Government can establish a “Legal Accelerator” that hosts freshly-graduated lawyers to help them start their own practices by providing them with the resources, skills to support startups

Role of Government

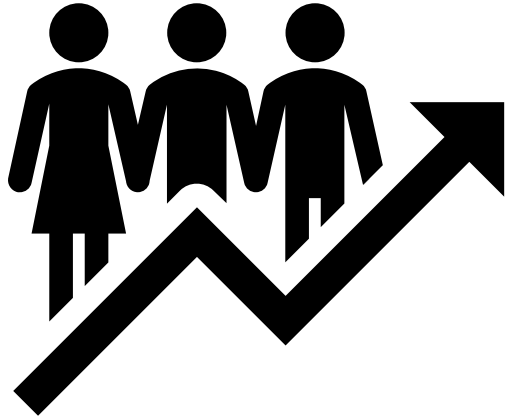


- Creating online platforms inspire, educate and connect (PPP Model) to for:
 - grants and research opportunities
 - Publishing information, news, updates, resources, relevant scientific databases, technology
 - Market place – consolidating innovation projects in Lebanon.
 - Innovation Map – Google-enabled map to identify all innovation players in Lebanon to facilitate connection Connecting key players
 - Open-innovation activities – such as innovation challenges that allow researchers and students to work on industrial solutions
 - Listing registered equipment in universities and research institutions for sharing them with different players

Innovation Platform

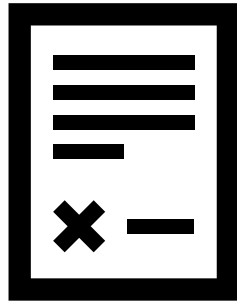
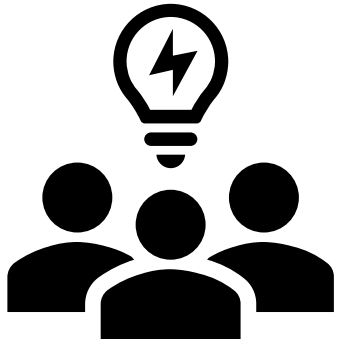


Accelerators and Incubators



- Create a research-based accelerator/incubator/competition:
 - Scout for innovative technologies that have commercial potential among students, researchers, and university staff
 - Connecting startups to international networks and professionals for funding, commercialization, and collaboration opportunities
 - Match researchers with other participants/applicants
- Matchmaking events that connect inventors with entrepreneurs who can help start spinoffs, approach investors, and handle day-to-day activities.
- Creating an internationalization-focused acceleration program:
 - Offering trainings, workshops, and tools about international markets.
 - Business Services: consulting services, testing facilities, strategy and planning, team building, financial planning, etc.
 - Networking and Mentorship with Lebanese and international professionals
 - Immersion: Sending top performing startups to participate in demo days and other events taking place in relevant international markets.
 - Matchmaking platforms/events to increase linkages with international key players
 - Soft-Landing: Supporting participants to execute their business plans in their targeted markets
 - Industry Liaisons: a formal focal point between member start-ups and corporates and investors with the purpose of facilitating and promoting partnerships and investments with members

IP Agents



- Training and Capacity Building for TTOs, faculty members, students, researchers, etc. on relevant IP topics and how they affect their research and work through trainings and capacity building or short webinars
- IP Agents can also play a role in the success of the Legal Accelerator through training courses, internships, and access to consultation

Analysis of Technology Transfer Readiness at Universities

- Research and academic capacity
- Technology transfer services
- Intellectual Property policy
- Entrepreneurship and innovation readiness

Status Quo of Research and Academic Capacity

University of Saint Joseph

- 8086 enrolled (2941 graduate and doctoral students)
- 308 full-time faculty (as of fall of 2017)
- Strongest research programs: Medical School, Engineering School, and School of Science
- 100+ programs in total
- Strong connection with alumni (Mobile application for connecting alumni, students, and faculty)
- No interdisciplinary programs, but multidisciplinary projects available

American University in Beirut

- 7,338 undergraduates, 1,471 graduates, 166 postgraduates
- 1200 instructional faculty (914 full-time, 286 part-time)
- Strongest research programs: Agriculture, Engineering, Medicine and Health schools
- 100+ programs
- Very active alumni office and chapters with strong communication and mentorship with students and researchers
- Interdisciplinary programs available
- AUB is the most active in research from the 5 interviewed universities

Holy Spirit University of Kaslik

- 3300 undergraduates, 1500 graduates, and 84 PhD
- 910 faculty members in total (230 full-time, 670 part-time)
- Strongest research programs: School of engineering, sciences, food and agriculture, business
- 16 different schools with their respective undergraduate, graduate, and continuing education programs
- Communication with alumni to improve curricula
- Entrepreneurship minor available to all students

Lebanese American University

- 7433 undergraduate students, 716 graduate students
- 838 total number of faculty members (323 full-time, 515 part-time)
- Strongest research programs: School of Engineering, and School of Medicine
- 60+ programs in total
- Alumni office available
- No interdisciplinary programs

University of Balamand

- 5000-6000 students in total, among whom 1300
- 1177 academic staff
- Strongest research programs: recycling and agriculture
- 40+ programs in total
- Collaborations with QOOT
- Alumni and industry are involved in judging student projects

Status Quo of Technology Transfer

University of Saint Joseph	American University in Beirut	Holy Spirit University of Kaslik	Lebanese American University	University of Balamand
<ul style="list-style-type: none"> Recently established a TTO Berytech Fablab is within their premises 20 research centers with fully equipped labs Funds some projects internally No awards for distinction in research Focuses on publishing more than technology transfer Professors are required to carry out research so they do not need incentives Demand-based research mainly through LIRA 	<ul style="list-style-type: none"> TTO available Partial and full funding available Center for Research and Innovation (CRIInn) Samih Darwazah Center for Innovation Management and Entrepreneurship iPark (a work in progress). Honorary and monetary awards for distinction in research available Technology-pull focused No actions taken to incentivize carrying out research projects There are efforts for patent commercialization with alumni diaspora 	<ul style="list-style-type: none"> In the process of developing their TTO (since 2017) work in progress between Elie Akhras and Asher Center On-campus FabLab Center for development of entrepreneurship Health and environment-related projects typically receive most funds University partially funds projects Monetary awards for excellence in research 	<ul style="list-style-type: none"> No TTO but in progress AR/VR and AI Labs available Innovation center (recently established) Incubator (to launch in fall) Partially funds research Honorary awards available for excellence in research 	<ul style="list-style-type: none"> No TTO FabLab is currently under construction with support from Berytech Testing labs available There are events related to entrepreneurship that are open to all students Partial funding available Honorary and monetary awards for excellence in research

Status Quo of IP Policy

University of Saint Joseph

- Has a set IP policy
- IP policy may change from case to case
- Communication of policy reliant on talks by expert from the Ministry of Economy
- Royalties: Researcher, university, and sponsor each receive 1/3
- Ownership belongs to the university
- Faculty promotion based on number of publications, citations, and patents, teaching capacity, and services to the university
- No designated office for prior art search of patent creation

American University in Beirut

- Has a set IP policy
- 14 patents were created in the last three years
- Royalties: inventor, department, and administration get 1/3 each
- Shared ownership between inventor, university, and adopting entity
- Starting research projects based on self-motivation of researchers
- Faculty promotion depends on number of publications, innovations, teaching activities, and others.
- Have an internal database of existing patents
- External researchers only within a collaborative framework

Holy Spirit University of Kaslik

- No set IP policy, it is determined on a case-by-case basis
- No patents were produced in the last 3 years
- Currently working on creating a culture that focuses on technology commercialization
- Faculty mainly promoted based on number of publications and number of patents
- Success stories are promoted on social media
- Allow external researchers (from private sector only)

Lebanese American University

- Has an IP policy but it is being revamped
- IP policy is communicated through Legal Office
- Research is the property of the faculty member with the exception of a major contribution of the university to the work (such as funding)
- Prior art search and patent creation is done by researchers
- External researchers can carry out research at LAU under agreements or joint projects

University of Balamand

- No set IP policy, it is determined on a case-by-case basis
- IP protection carried out by office of provost, office of president, and legal office
- Students mainly manage their own IP protection processes with support from faculty
- Welcomes external researchers to UoB

Status Quo of E&I Readiness

Characteristic	University of Saint Joseph	American University in Beirut	Holy Spirit University of Kaslik	Lebanese American University	University of Balamand
Entrepreneurship Center	Berytech *It is an independent center but associated to USJ	✓	✓	Recently Established	
E&I courses	✓	✓	✓	✓	✓
Operating TTO	Recently Established	✓	In process		
Internal funds		(Co-funds available)		✓	✓
External funds	✓	✓	✓	✓	✓
Incubator/accelerator	Berytech *It is an independent center but associated to USJ	✓		Plan to launch in Fall of 2019	
IP Policy	✓	✓	Case-by-case	In process	Case-by-case
Industry Engagement	✓	✓	✓	✓	✓
Number of publications	1500 paper in the last 5 years	In 2018, 1162 publications	500 in the last 9 years	332 in the last 3 years	232 overall publications



Great Advantage in Technology



Using AR/VR, and AI Lab for the development of research, production, testing, and education.

International Presence



Reach out to Lebanese diaspora and industries for R&D, academic, and professional purposes

No TTO



Establishing a TTO, build personnel's capacity, and raising awareness of IP & TTO services



Connections with Industry



Strengthen industry-academia collaboration through creating events and programs

Newly Established TTO



Undergo capacity building activities for TTO personnel to reach a certain set of skills

Entrepreneurship Center



Engage in activities and tracks with researchers (Medicine, Engineering, and Science)

Alumni App



Strengthen links with alumni, especially the ones in the diaspora



Positive Image in the Market



Formalize internship processes through connecting with government and industry players

Top Medical Facilities



Introduce multidisciplinary programs related to medical sciences and technologies

Most Advanced TTO

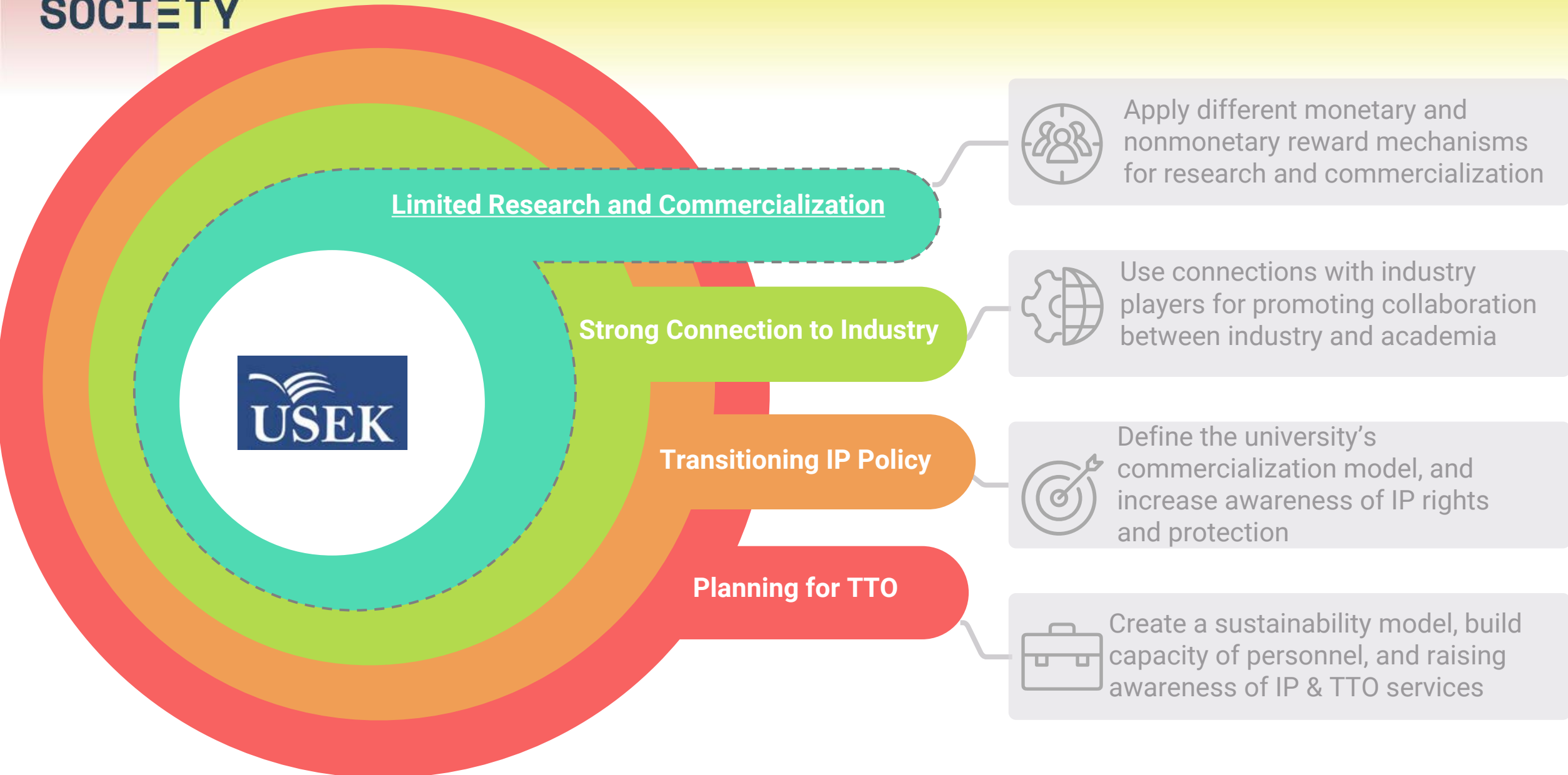


Carry out capacity building focusing on prior art search and commercialization activities

Strong Networks



Reaching new markets and promoting internships, R&D, and support through diaspora and industry players



Limited Research and Commercialization

Strong Connection to Industry

Transitioning IP Policy

Planning for TTO



Apply different monetary and nonmonetary reward mechanisms for research and commercialization



Use connections with industry players for promoting collaboration between industry and academia



Define the university's commercialization model, and increase awareness of IP rights and protection



Create a sustainability model, build capacity of personnel, and raising awareness of IP & TTO services



Networks with International Universities



Strengthening industry-academia collaboration for R&D, professional, and academic purposes.

Limited Commercialization



Establishing the infrastructure for commercialization, promoting applied research, and encouraging the commercialization of research

Weak Alumni Network



Involving the alumni in activities through the university's various offices and faculties

No TTO



Create a sustainable TTO, build capacity of personnel, and raise awareness of IP & TTO services

Annex 1: Skills needed at TTOs

TOP DOWN

TTO Services and Activities						
		TT Culture		Industry Academia Collaboration		
		Organize Seminars for Academia	Organize Seminars for the Industry	Market TTO Services to Industry/ Academia	Establish/ maintain partnership with Industrial Entities	Communicate Industry Needs & State-of-the-art Technologies to Academia
Skills	Business Writing	Yes	Yes	Yes	Yes	Yes
	Writing Grants Proposals					
	Presentation Skills	Yes	Yes	Yes	Yes	Yes
	Communication Skills	Yes	Yes	Yes	Yes	Yes
	Market Research		Yes	Yes	Yes	
	Marketing Strategy		Yes	Yes	Yes	
	Selling by Objective		Yes		Yes	
	IP 101	Yes	Yes			Yes
	Patent Information Services					Yes
	IP Contracts					
	Technology Transfer					
	Business Strategy & Planning with IP					
	Economics and Management of Technology	Yes	Yes			
	TICO Operations Management					

TTO Services and Activities										
		Technology Commercialization								
		Technology Scouting	Invention Disclosure Process	Technical Assessment	Market Assessment	IP Strategy	IP Protection	IP Valuation	Market & Sell Inventions	Draft License Agreements
Skills	Business Writing								Yes	
	Writing Grants Proposals									
	Presentation Skills	Yes							Yes	
	Communication Skills	Yes	Yes						Yes	
	Market Research	Yes			Yes				Yes	
	Marketing Strategy								Yes	
	Selling by Objective								Yes	
	IP 101	Yes	Yes				Yes			
	Patent Information Services	Yes		Yes	Yes		Yes		Yes	
	IP Contracts									Yes
	Technology Transfer							Yes	Yes	
	Business Strategy & Planning with IP					Yes				
	Economics and Management of Technology					Yes				
	TICO Operations Management		Yes							

TTO Services and Activities							
		TTO Operations					
		Develop IP Policy	Develop TICO Procedures & Required Agreements	Build Networks of Stakeholders	IP Policy	Operations Tools, Databases, Platforms	TICO Sustainability & Securing Grants
Skills	Business Writing			Yes	Yes		
	Writing Grants Proposals						Yes
	Presentation Skills				Yes		
	Communication Skills			Yes	Yes		
	Market Research			Yes			
	Marketing Strategy			Yes			
	Selling by Objective			Yes			
	IP 101	Yes					
	Patent Information Services						
	IP Contracts	Yes	Yes				
	Technology Transfer						
	Business Strategy & Planning with IP						
	Economics and Management of Technology						
	TICO Operations Management	Yes	Yes	Yes		Yes	

Conclusions



Gap analysis

Valley of Death
No Market Pull
Models
Limited Research
and Prototyping
Facilities
Disconnect from the
Diaspora
Limited
Internationalization
Limited
Collaboration



Top down

Licensing and
Selling of
technology
Spinning Off



Enabling Activities

Information
Services
Networking and
Communications
Collaborations and
Partnerships



Bottom up

Promoting the
culture of
technology transfer
and research
valorization in
Lebanon



Stakeholders

Government
institutions
Accelerators and
incubators
IP agents

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United Nations ESCWA	Fuad Mrad
University of Balamand	Rodrigue Elbalaa

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