Collaborative Research: Perspectives and Challenges in Bangladesh

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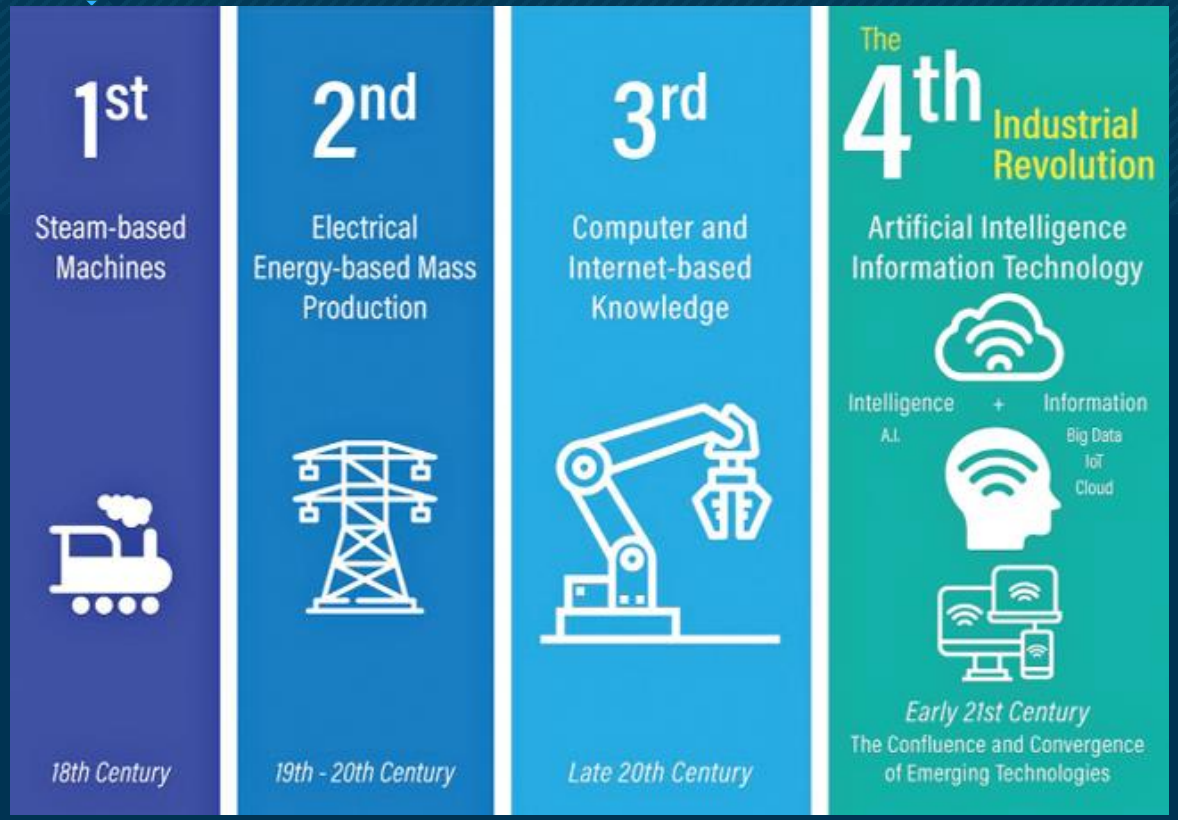


Bangladesh is on the cusp of the 4th Industrial Revolution (4IR), which will bring with it new difficulties such as transforming the production sector, automating old jobs, and increasing prospects for creativity and efficiency. These disruptions in industries and job markets, as well as the total industrial transformation that we must embrace to become a developed country

Bangladesh was placed **117th in skills and 105th in innovation capacity out of 141 nations** in the Global Competitiveness Index 2019. It was also reflected in the Global Innovation Index 2020, which rated Bangladesh 116th out of 131 economies on overall innovation metrics.

Powering Change: Youth of Bangladesh 47.6 million or 30 percent of the total population are young (10-24 years)

What skills will be necessary for the future profesionnals ?

WORLD ECONOMIC FORUM

Top 10 skills

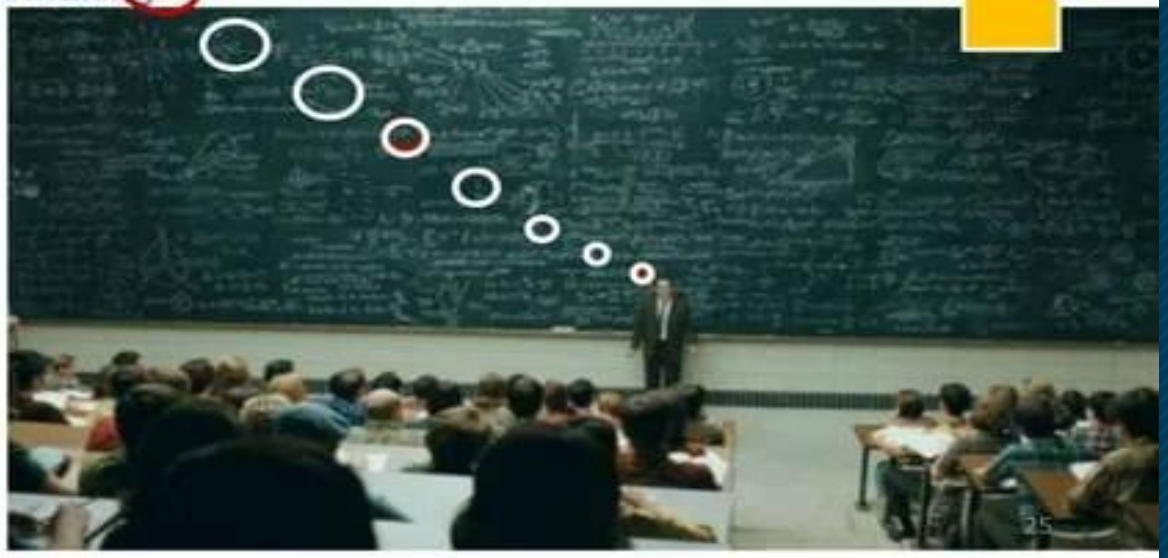
in 2020	in 2015
1. Complex Problem Solving	1. Complex Problem Solving
2. Critical Thinking	2. Coordinating with Others
3. Creativity	3. People Management
4. People Management	4. Critical Thinking
5. Coordinating with Others	5. Negotiation
6. Emotional Intelligence	6. Quality Control
7. Judgment and Decision Making	7. Service Orientation
8. Service Orientation	8. Judgment and Decision Making
9. Negotiation	9. Active Listening
10. Cognitive Flexibility	10. Creativity

https://www.weforum.org/agenda/2016/01/the-10-skills-you-need-to-thrive-in-the-fourth-industrial-revolution/

We need to change the education model

in 2020

1. Complex Problem Solving
2. Critical Thinking
3. Creativity
4. People Management
5. Coordinating with Others
6. Emotional Intelligence
7. Judgment and Decision Making
8. Service Orientation
9. Negotiation
10. Cognitive Flexibility



Creativity??

http://www.collegetimes.com/

University

Education

Learning outcomes (Skills)

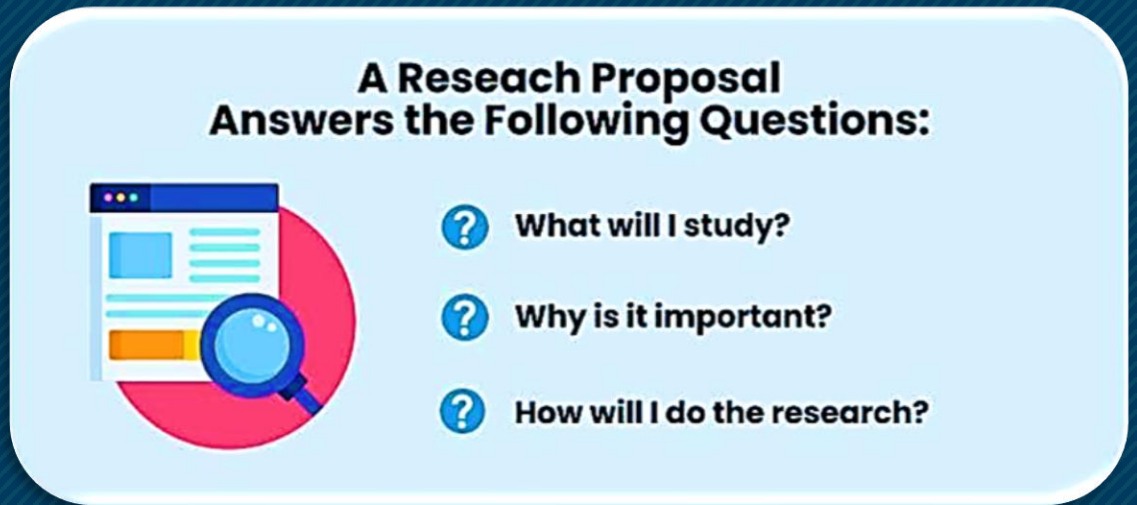
Talent

Industry


DAAD
DAAD PROJECT LEADER MEETING
HEI Partnerships – Transferring Knowledge from Campus to Society and Economy
Yogyakarta, Indonesia | 14–17 October 2024
DAAD PROJECT LEADER MEETING
HEI Partnerships - Transferring
Knowledge from Campus to Society and Economy
Yogyakarta, Indonesia 14-17 October 2024
Kencana
PHOTOGRAPHY

Research Proposal

- Written plan of a study
- Details about what the researcher intends to do
- A good research proposal is based on scientific facts and on the art of clear communication
- It is like a blue print of a building plan before the construction starts
- Writing a formal research proposal should be started by the time one has decided on the topic for the study



Purpose of a Research Proposal

- Proposal in the university context
- Proposal for research grant or funding
- Proposal for collaborative research

Factors

Duration of project, Funding, Facility of research, competition

Cooperation v. Collaboration

- Partners using a cooperative strategy to work together to meet their individual goals.
- Partners using a collaborative strategy establish common goals and agree to their personal and institutional power to achieve them.

Collaborative research involves multiple individuals or groups working together to investigate a particular topic or question. It's a powerful approach because it leverages diverse expertise, perspectives, and resources to achieve a common research goal.


5 Types of Research Collaboration
01
Collaboration within an academic institution
Faculty, staff, administrators, and students
02
Collaboration with other academic institutions
Mutual benefits through the sharing of expensive and limited resources
03
Collaboration with a government entity
Government agencies act as financial collaborators by offering resources and funding opportunities for research projects.
04
Collaboration with private industry
Innovative businesses are pushing the influence of collaboration between academic researchers and the private sector.
05
Collaboration with international researchers
Increases the value of both the process and its outcomes by broadening the cultural perspectives and applications of a research project.

Keys to Research Collaboration

- Right People at the Table (Team formation)
- Trusting Relationships
- Shared Goals
- Open Communications
- Division of Labor
- Effective Leadership
- Ethical consideration

Collaborative research can lead to more comprehensive and impactful outcomes than individual efforts alone. By leveraging the collective expertise and resources of multiple collaborators, researchers can address complex problems more effectively and generate new insights that benefit society as a whole

Strategies for successful Research Collaboration

- Establish clear goals and expectations
- Foster open and effective communication
- Leverage diverse expertise and resources
- Establish clear guidelines for authorships and intellectual properties
- Foster a culture of mutual respect and trust

Embracing Research Collaboration for a Brighter Future

1. Accelerating Innovation
2. Bridging Knowledge Gaps
3. Leveraging Resources
4. Fostering Diversity and Inclusion
5. Addressing Global Challenges

The Benefits of Collaborative Research

- Enhanced Creativity and Innovation
- Access to Specialized Resources and Expertise
- Increased Publication and Citation Impact
- Accelerated Progress and Problem Solving
- Strengthened Networking and Collaboration Opportunities

FasterCapital

University Industry Collaboration in Bangladesh: Where We Are Now?

Caltech Boeing Strategic Agreement 2004 – Present

- Patent applications have been filed.
- Students are encouraged to participate in internships with the company.
- Boeing has hired researchers in key areas.
- Company and academic scientists regularly interact throughout their respective collaborations. Symposiums may be held at the company or at Caltech, corporate scientists come to campus to visit and/or work in the lab of their Caltech collaborator, and Caltech faculty may give talks at the company.
- Caltech faculty members provide regular reporting and updates to their scientific partners and Boeing and Caltech hold an annual “Research Review” on campus to discuss the projects and key findings.
- Caltech faculty played a key role in the certification of Boeing’s new 787 “Dreamliner”

A Journey of Nanocellulose Vehicle (NCV) Development: 2000-Present by Kyoto University, Japan

- Patent applications have been filed.
- Company and academic scientists regularly interact throughout their respective collaborations. Corporate scientists come to campus to visit and/or work in the lab of their, and faculty may give talks or advice to the company. Yearly conference or meeting was held.
- New Energy and Industrial Technology Development Organization (NEDO) involved in this project and ensure proper funding
- Kyoto University faculty played a key role in the development of Nanocellulose Vehicle (NCV)

SCIENCE, TECHNOLOGY AND MARKETS

Science

- Possibilities
- Options
- Solutions

Can I do it ?

Technology

- Opportunities
- Feasibility
- Desirability

Is it worth doing it ?

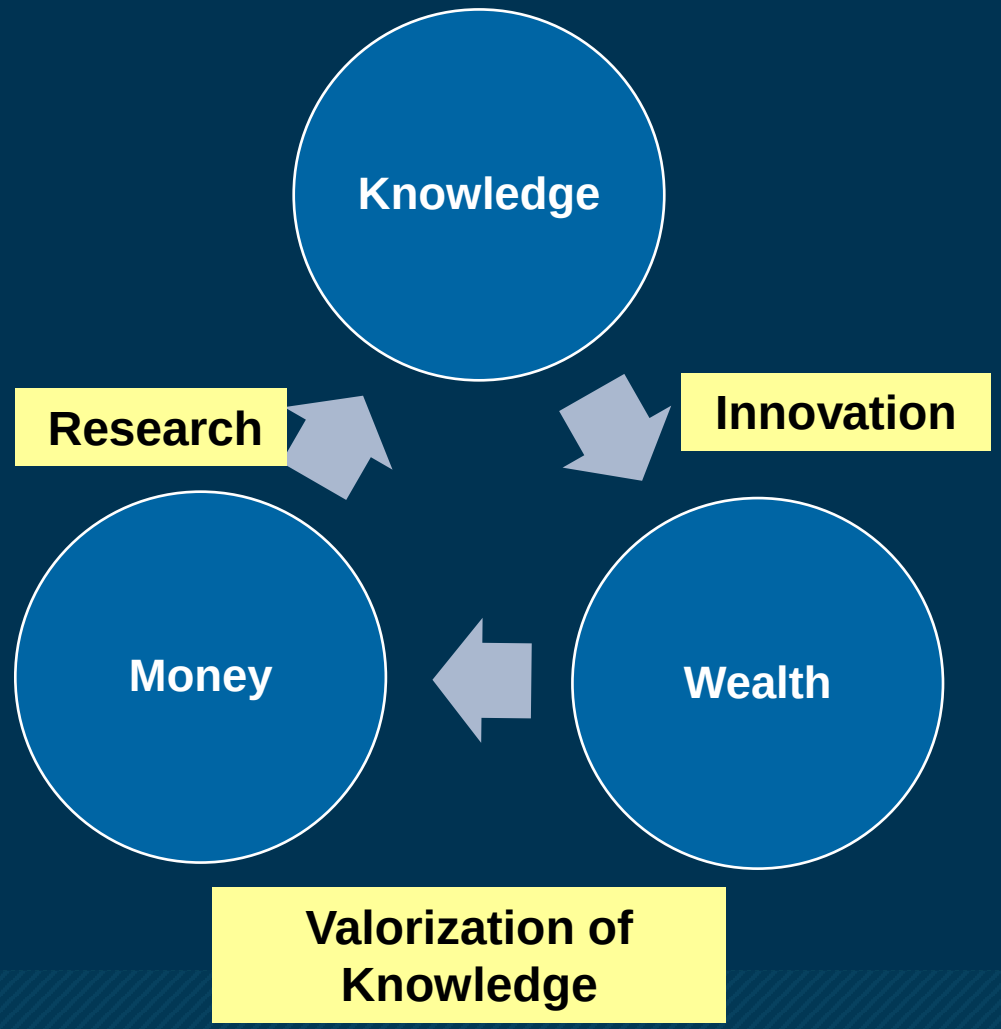
Markets

- Uniqueness
- Customer choice
- Will the customer pay ?

Does anyone need what I am doing ?

CREATING WEALTH OUT OF KNOWLEDGE

- ***Where*** : Universities, research laboratories, society, industry
- ***Who*** : Faculties, scientists, students, professionals in industry
- ***How*** : Technology transfer and licensing, consulting, spin off ventures, in house conversion to products and services, out-licensing and co-development with partners
- ***Why*** : To create a virtuous cycle of wealth creation from knowledge

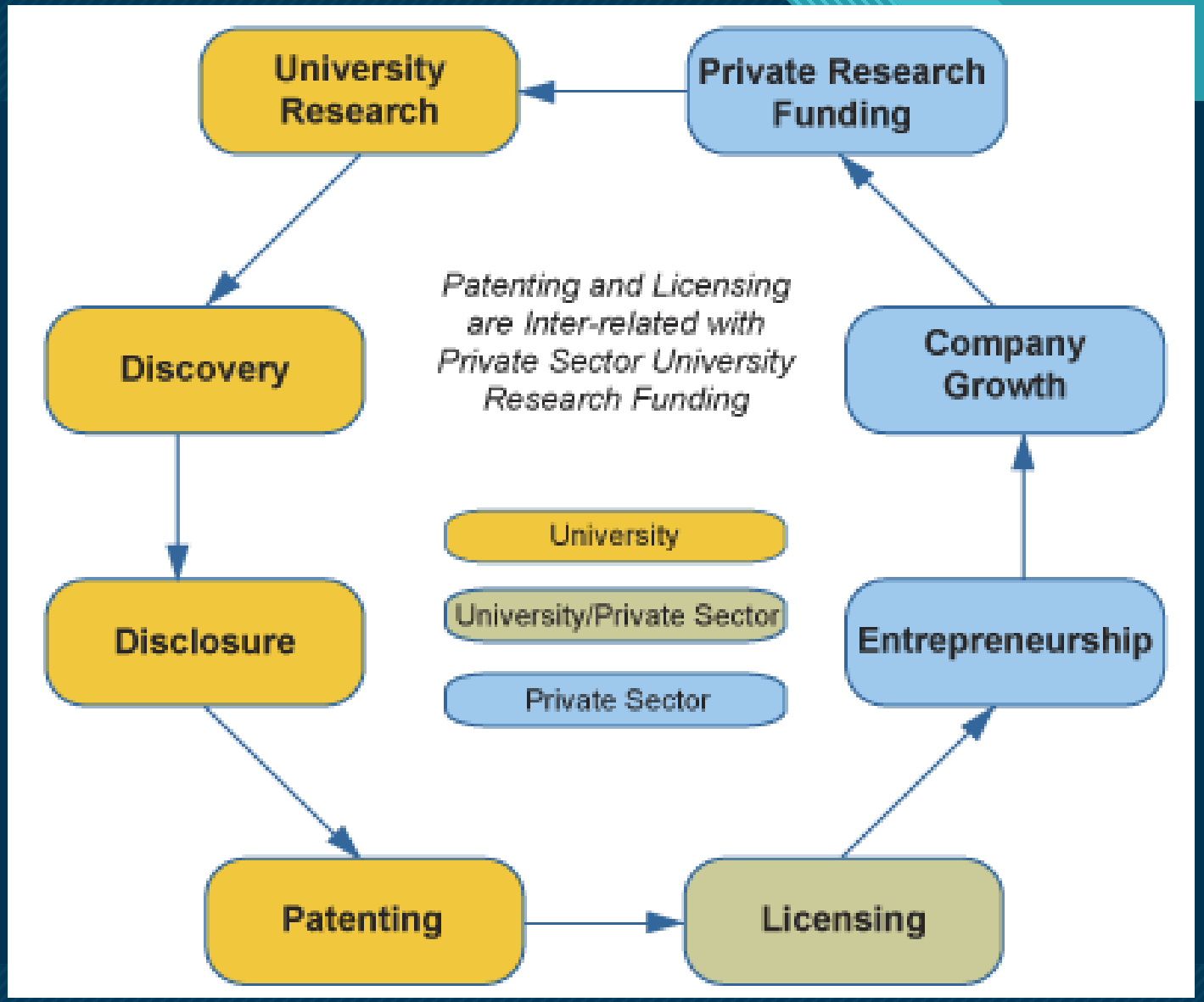


THE PATENT AS A TOOL FOR TECHNOLOGY TRANSFER

THE PATENT …
AN EXCELLENT SOURCE OF INFORMATION

- Create wealth out of intellectual property
- Create value to customer
- Provide secure modes for technology transfer
  - Minimize probability of infringement
  - Open global markets
- Competitive assessment

Discovery to entrepreneurship



Based on IP created in the Universities

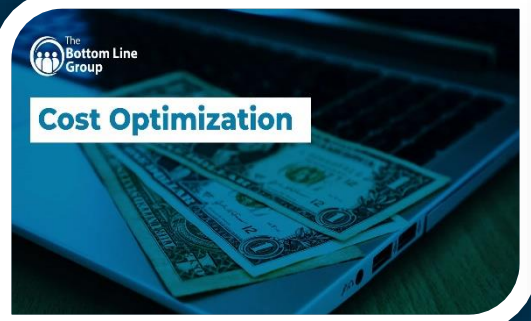
Goal for next 15 years: (Expectation)

1000 Startups, 1 million jobs, 1 billion dollars value creation

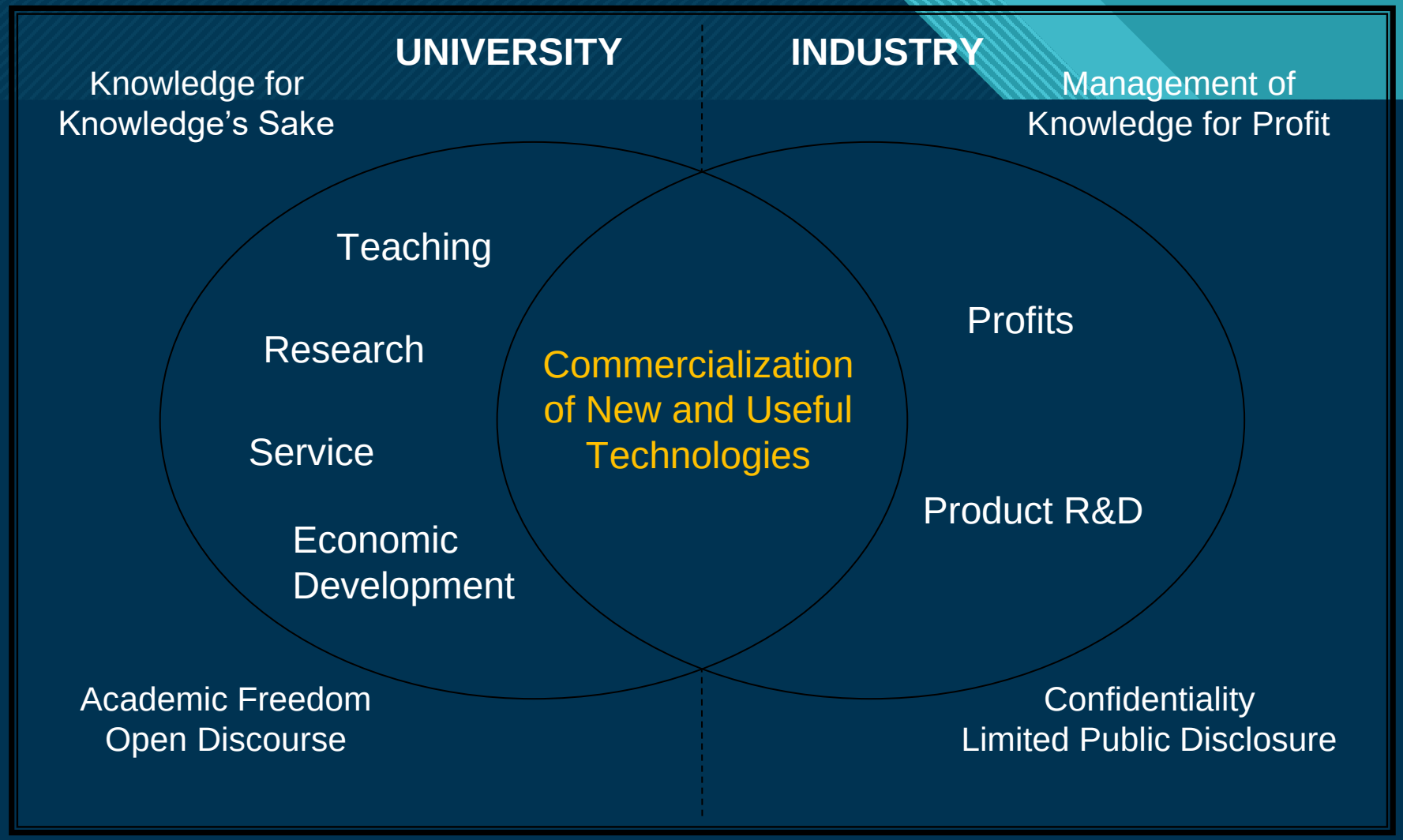
Initiating University– Industry Collaboration in Bangladesh

University
- Innovation
- Research Freedom
- No care of costing
- Environment friendly invention

Industry
- Turn-over maximization
- Profit maximization
- Customer satisfaction



The Cultural Dilemma



Academia and industry : Fundamentally different goals and value systems; whereas, industry has problems for which they seek solutions, academia comes up with solutions where seemingly there is no problem !

Necessity of University Industry collaboration

University
- Identify area of improvement
- Understand business demand
- Convey new feature and potential in profitable way

Improving Education Quality

Research and Development

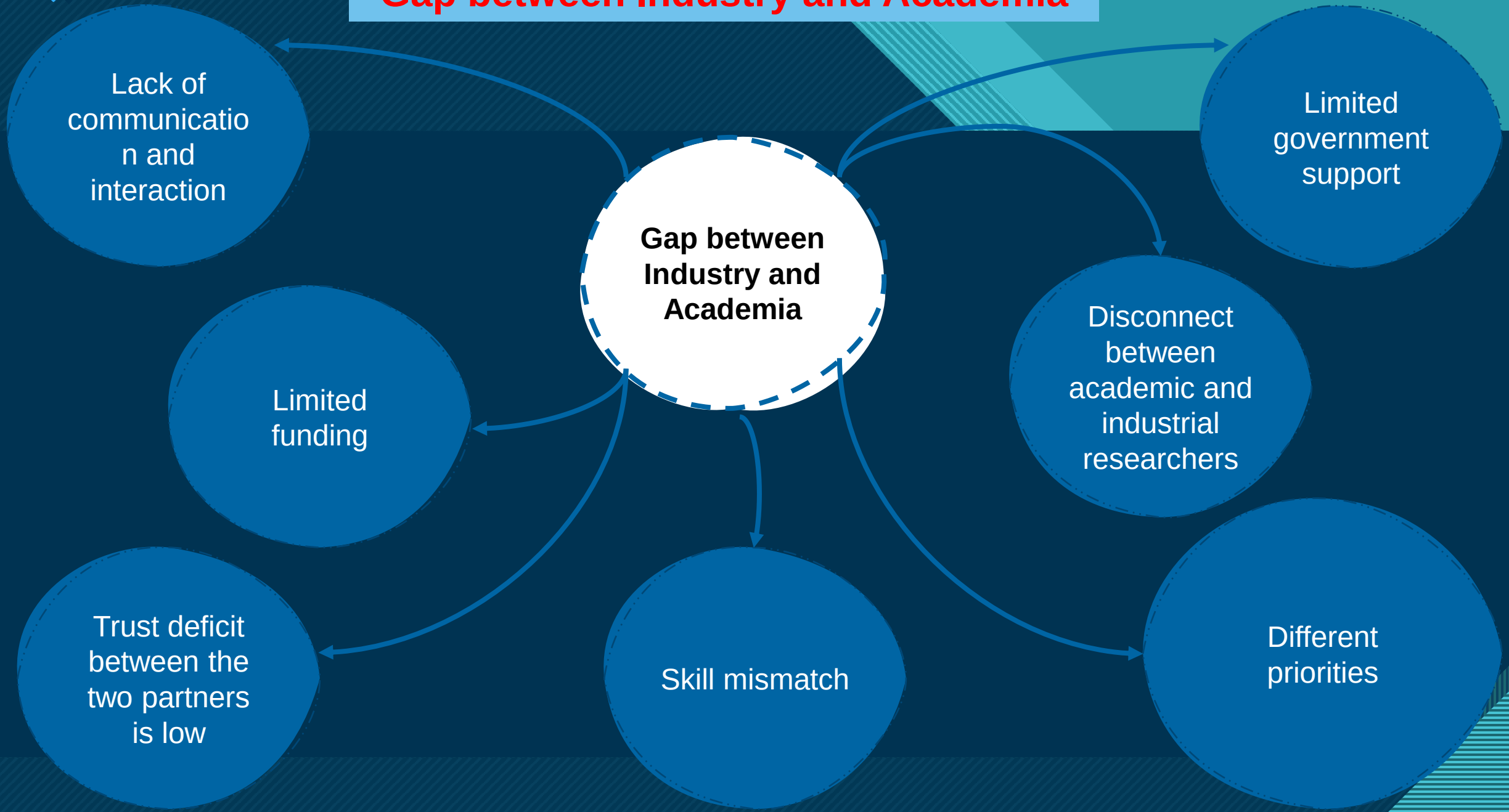
Skilled Workforce

Entrepreneurial Development

Economic Development

Industry
- Accept improvement
- Accept innovation
- Commitment on society
- Global market understanding
- Long-term vision

Gap between Industry and Academia



Major obstacles between University Industry collaboration

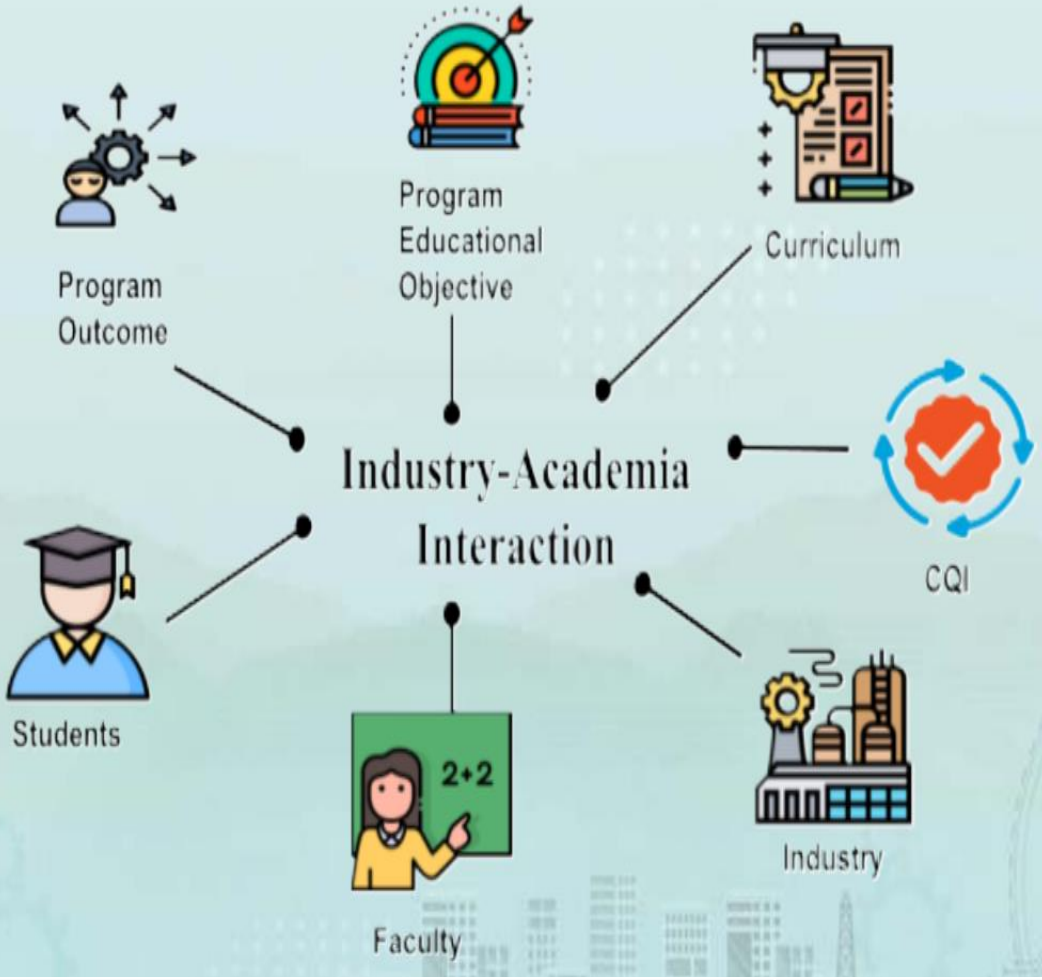
- In terms of outputs, firms are usually interested in how quickly new patents or new products can be obtained, and want to delay publications to avoid disclosing information. University researchers, in contrast, are typically motivated to publish research results as fast as possible.

- Industry is concerned about secrecy and misalignment of expectations with regard to intellectual property (IP) rights and making a profit from them.

- Difficulties in negotiating a collaboration include lack of information, difficulties finding contact persons, and transaction costs of finding the right partner, among others.

- Heavy workload for academic staff

Strengthening the Bridge Between Academic and the Industry



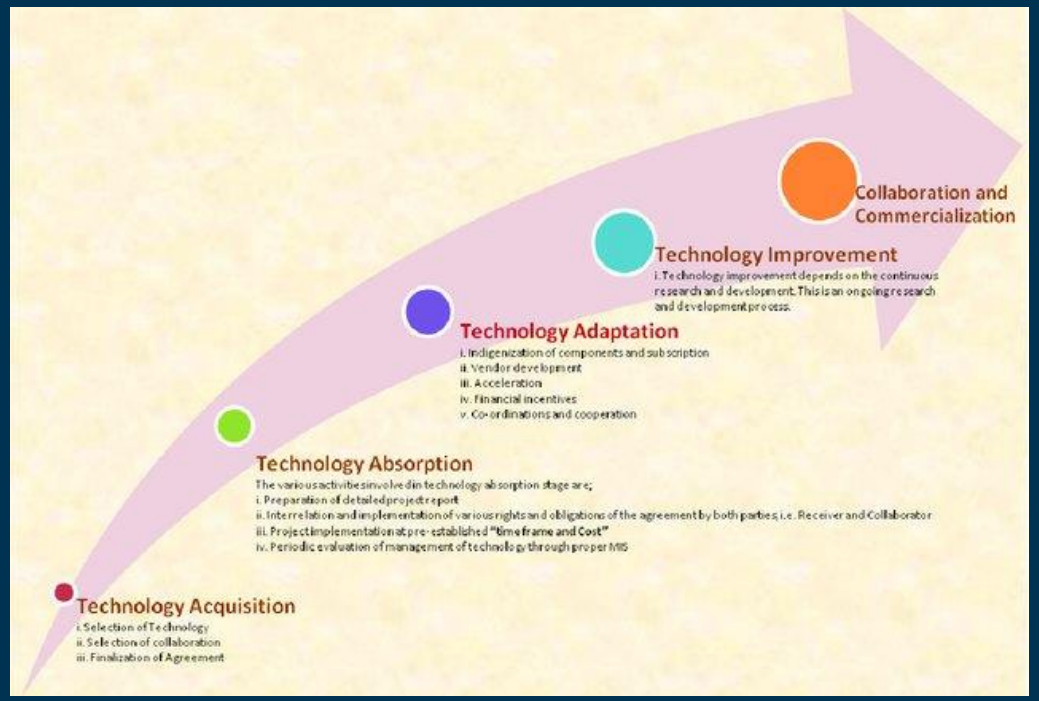
- Graduate recruitment
- Work/study programmes (e.g. internships)
- Assist in supervising/mentoring student projects
- Attend/sponsor student project exhibitions and Assist in the formal assessment of students
- Provide careers talks, guest lectures
- Provide ideas for student projects
- Involve industry in quality assurance, design and review of curriculum
- Field trips/visits to company
- Industry provide access to specialist equipment or sponsor equipment/labs

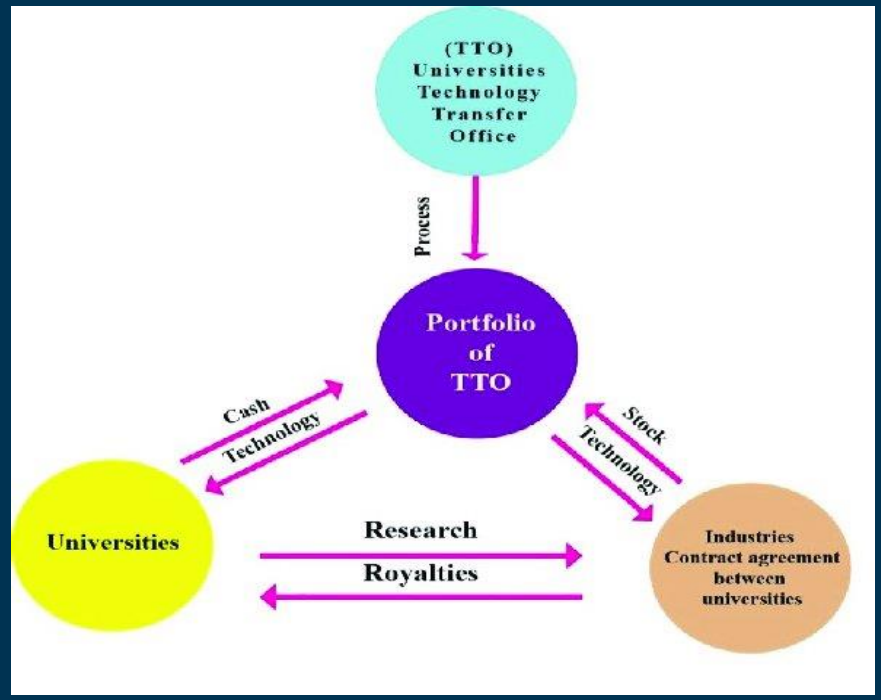
Commercialization of intellectual property	Transfer of university-generated IP (such as patents) to firms (e.g., via licensing).
Informal interaction	Formation of social relationships (e.g., conferences, meetings, social networks).

Steps to Establish Industry-University Partnerships

Working with INDUSTRY partners	Working with UNIVERSITY partners
1. Research and identify possible partners, e.g. ❑ Talk with colleagues and former students in industry	**1. Research and identify possible partners, e.g.** ❑ Read pubs, websites; attend academic conferences
2. Connect with industry scientists and engineers, e.g. ❑ Ask colleagues for intros/attend meetings featuring industry speakers	**2. Connect with a faculty member** ❑ Study up, then email or call
3. Get to know industry researchers and build relationships, e.g. ❑ Invite industry researchers to campus	**3. Get to know the academic department or center/institute and the individual faculty member(s)** ❑ Get a meeting to areas of common interest
4. Exchange concepts and Ideas ❑ Keep talking. This takes time..	**4. Exchange concepts and Ideas** ❑ Keep talking. This takes time..
5. Work out a project that is of mutual interest ❑ Establish a formal relationship	**5. Work out a project that is of mutual interest** ❑ Establish a formal relationship

Process of Technology Transfer to Industry

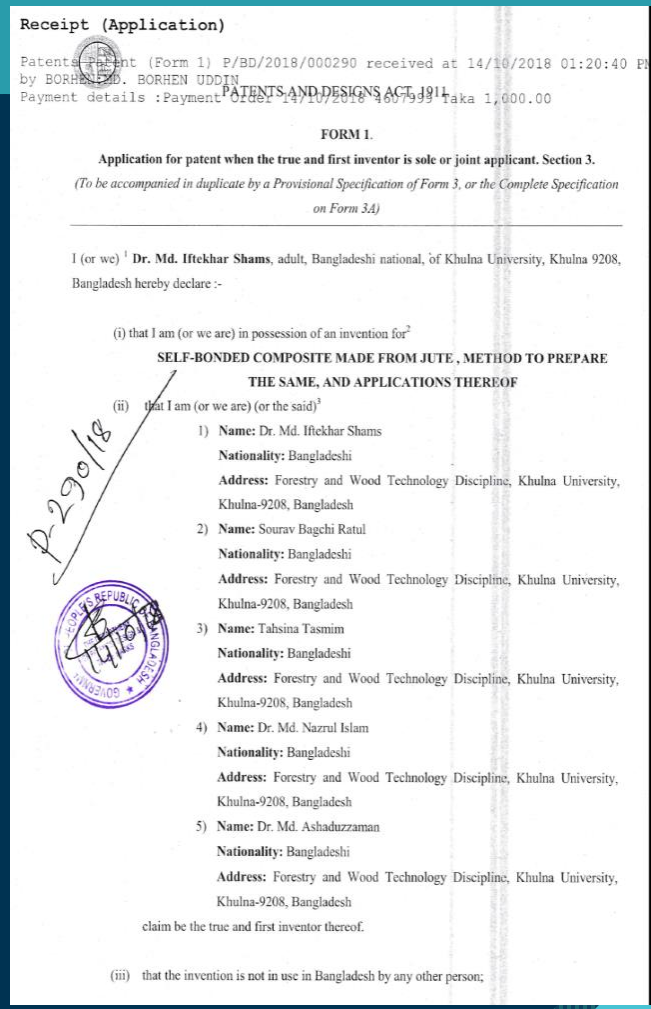




The exchange of technical skills, knowledge, and resources for both science and industry can be mutually beneficial

Khulna University-Akij Particleboard Mills Ltd.
2016–2018

- Patent applications have been filed.
- Company and academic scientists regularly interact throughout their respective collaborations. Industry scientists come to campus to visit and/or work in the lab, and faculty may give talks or advice to the company.
- World bank and Ministry of Education involved in this project and ensure proper funding
- Both share their lab facilities and testing facilities
- Khulna University faculty played a key role in the development of Formaldehyde free jute stick boards



Receipt (Application)

Patents Patent (Form 1) P/BD/2018/000290 received at 14/10/2018 01:20:40 PM
by BORHEN UDD. BORHEN UDDIN
Payment details :Payment Order 14/10/2018 469999 Taka 1,000.00

PATENTS AND DESIGNS ACT 1911

FORM 1.

Application for patent when the true and first inventor is sole or joint applicant. Section 3.

(To be accompanied in duplicate by a Provisional Specification of Form 3, or the Complete Specification on Form 3A)

I (or we) [1] **Dr. Md. Iftekhar Shams**, adult, Bangladeshi national, of Khulna University, Khulna 9208, Bangladesh hereby declare :-

(i) that I am (or we are) in possession of an invention for[2]

SELF-BONDED COMPOSITE MADE FROM JUTE , METHOD TO PREPARE THE SAME, AND APPLICATIONS THEREOF

(ii) that I am (or we are) (or the said)[3]

1) **Name:** Dr. Md. Iftekhar Shams
Nationality: Bangladeshi
Address: Forestry and Wood Technology Discipline, Khulna University, Khulna-9208, Bangladesh

2) **Name:** Sourav Bagchi Ratul
Nationality: Bangladeshi
Address: Forestry and Wood Technology Discipline, Khulna University, Khulna-9208, Bangladesh

3) **Name:** Tahsina Tasmim
Nationality: Bangladeshi
Address: Forestry and Wood Technology Discipline, Khulna University, Khulna-9208, Bangladesh

4) **Name:** Dr. Md. Nazrul Islam
Nationality: Bangladeshi
Address: Forestry and Wood Technology Discipline, Khulna University, Khulna-9208, Bangladesh

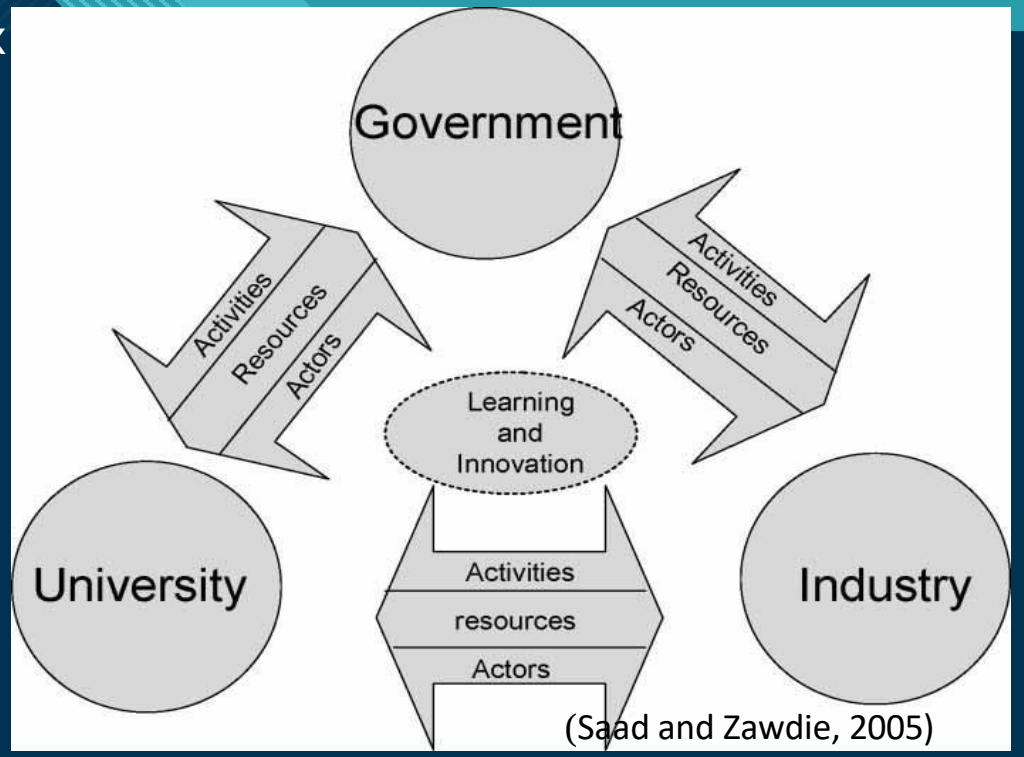
5) **Name:** Dr. Md. Ashaduzzaman
Nationality: Bangladeshi
Address: Forestry and Wood Technology Discipline, Khulna University, Khulna-9208, Bangladesh

claim be the true and first inventor thereof.

(iii) that the invention is not in use in Bangladesh by any other person;

University-Industry-Government Relations

- Government support: The government can play a crucial role in promoting university-industry collaboration by providing funding, tax incentives, and other support to encourage industry-university partnerships
- Proactive universities: Universities can take the lead in promoting university-industry collaboration by establishing dedicated departments, research centers, and innovation hubs to encourage interaction between industry and academia.
- Industry engagement: Companies operating in Bangladesh should be encouraged to collaborate with universities on research projects, internships, and other initiatives that can provide students with practical experience and companies with access to new ideas and talent.



(Saad and Zawdie, 2005)

- Knowledge and technology transfer: Both universities and companies should work to facilitate the transfer of knowledge and technology between each other.
- Networking and outreach: Universities and companies should work to build a network of industry and academic leaders in Bangladesh to facilitate collaboration and encourage the sharing of ideas and best practices.

Challenges of successful collaboration

- Limited Funding
- Unequal research capacity
- Fragmented research ecosystem (Lack of coordination with other institutes)
- Brain drained
- Limited access to information and resources
- Infrastructure challenges

Way forward

- Active University-Industry Linkages
- Curriculum of the University should focus on industry latest demand (Include industry expert)
- Guest lecture may be held, inviting people from Industry
- Entrepreneurial University approach (Startup)
- International University collaborations
- Setting up an Innovation Hub and TTO at Universities, & adopt Innovation Policy
- Faculties should work at least 3 months at industry and government should provide subside to the industry
- Patent filling should be encouraged and intellectual properties should be preserved.
- Accreditation of the laboratories of the universities
- Ensure funding and Government support
- Compulsory 1 year industrial training for students

University Grants Commission (UGC) may take the lead, or a separate authority/organization may be created to lead the same. Bangladesh may consider establishing a university-industry higher education collaboration council (UICC).

- **Mainly focus on Agriculture, IT sector, Pharmaceuticals and Materials sector in Bangladesh**

Thank You for your kind attention

Brainstorming Session

- Most of the knowledge generated by researchers at universities is not put into practice and remains in publications, even though it often contains solutions to real life problems. How do you ensure that your research results are put into practice?
- What approaches do you use to integrate civil society and business into your project activities? What measures do you use to integrate real problems of civil society and the economy into teaching and research?
- What role do students play when it comes to transforming knowledge? How can they be used even more as multipliers?
- What significance do academic spin offs have for economic and social development in their regions and how can they be further strengthened?