Lecture 5: Open Innovation and Technology Transfer

CS6215 / IT 6215

MANAGEMENT OF TECHNOLOGY AND INNOVATION (MTI)

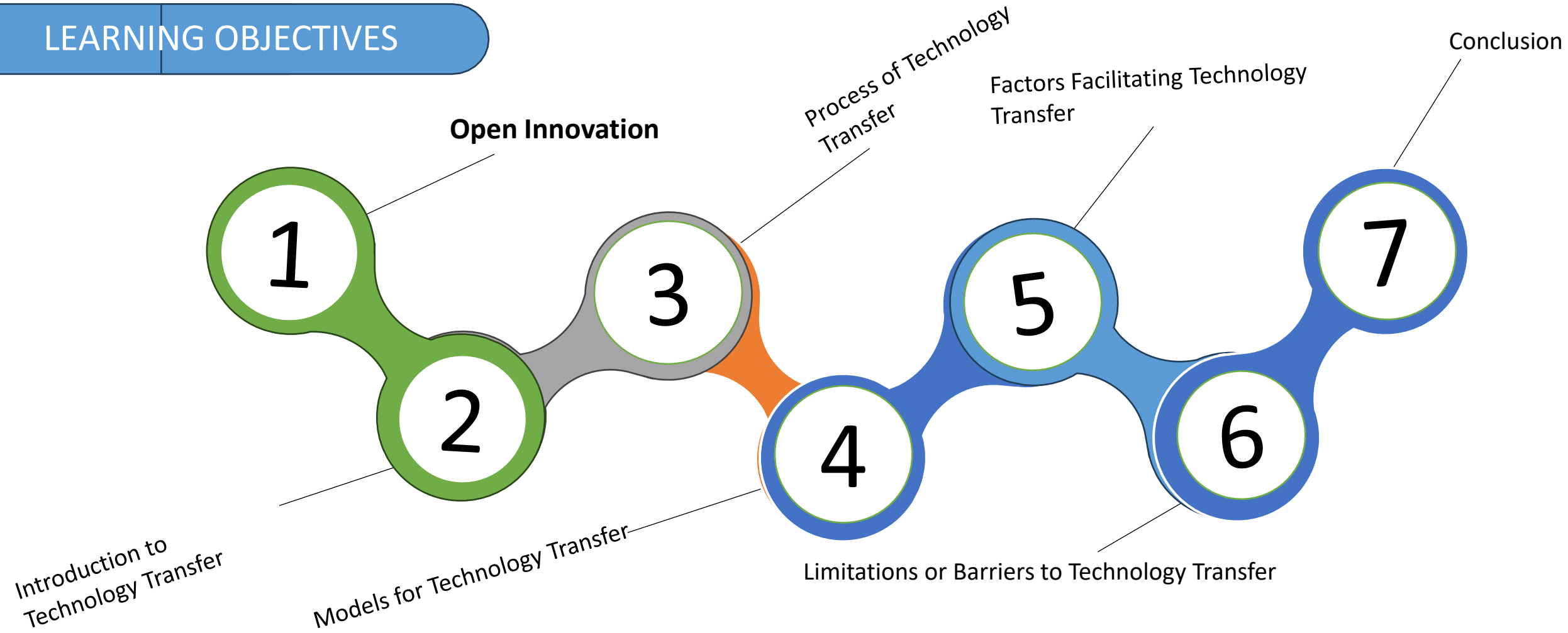
Mr. Robert Mtowe – 0766838451

Mbeya University of Science and Technology - MUST

PRESENTATION OVERVIEW

This presentation will explore the concepts of open innovation and technology transfer, highlighting their importance in driving innovation and achieving sustainable growth.

LEARNING OBJECTIVES



Open Innovation and Technology Transfer are closely related concepts in Innovation and Research ecosystems, but they serve distinct purposes in different contexts.

OPEN INNOVATION

Open Innovation refers to the process of using External and Internal ideas, technologies, and resources to accelerate innovation within an organization.

Open Innovation encourage collaboration between Organizations, Individuals, Academia, Governments and other Stakeholders to solve problems, develop new products or improve services.

PRINCIPLES OF INNOVATION

- **Inbound Innovation:**

An Organization look outside their boundaries to source ideas, technology, and solutions. For example , collaborating with startups, acquiring patents, or engaging in crowdsourcing.

- **Outbound Innovation:**

An organization share unused or underutilized ideas, patents, or technologies with others who can utilize them better, either through licensing, joint ventures, or spin-offs.

- **Collaborative Innovation:**

An Organization collaborate in developing solutions with external partners, often through partnerships or joint projects.

Examples:

- ✓For example a Pharmaceutical company working with Universities to develop new drag.
- ✓Crowdsourcing ideas for product design from consumers
- ✓Licensing technologies to or from third parties to speed up innovation

Benefits:

- ✓It take short period of time to introduce new product to the market.
- ✓Reduce Research and Development cost.
- ✓Increase competitive advantage through diverse inputs and collaboration

TECHNOLOGY TRANSFER

Technology transfer is the process of transferring skills, knowledge, technologies, manufacturing methods, or facilities from one organization, institution, or sector to another.

Technology transfer is often aimed at enabling further development, commercialization, or application of the technology in different contexts.

Examples of Technology transfer:

- ✓NASA's technology for space exploration being adapted for use in consumer products.
- ✓A university transferring its AI algorithm to a tech startup.
- ✓A multinational corporation sharing manufacturing techniques with a subsidiary in another country

Process of Technology Transfer

1

Discovery and Development

Researchers or inventors create new technologies, methods, or products in laboratories or institutions.

2

Protection of Intellectual Property (IP)

The technology is secured through patents, copyrights, or trademarks to protect ownership rights.

3

Evaluation and Feasibility Analysis

Assessing the technology's commercial potential, market demand, and scalability.

4

Partner Identification

Finding suitable organizations or companies to adopt and commercialize the technology.

5

Negotiation and Licensing

Establishing agreements that outline terms for usage, royalties, and ownership.

6

Commercialization

Implementing the technology in production or services and launching it into the market.

MODELS OF TECHNOLOGY TRANSFER

1. Top-Down Model

In the Top-down model, the decision making and initiation of technology transfer originate from higher level authorities or institutions such as Government.

The technology is developed or identified at the top level and then disseminated to lower levels or end users. Example, A government led initiative that develops renewable energy technology and distribute it to rural areas

2. Science Park Model:

This model involves the establishment of science parks or innovation hubs where universities, research institutions, and industries collaborate. The parks provide infrastructure, facilities, and a conducive environment for technology transfer and commercialization.

MODELS OF TECHNOLOGY TRANSFER

3. Intermediary Agency Model:

In this model, an intermediary organization facilitates the technology transfer process. These agencies act as a bridge between the developers of technology and the users, handling licensing, patenting and commercialization. Example, Technology Transfer Offices(TTOs) in universities.

4. Knowledge Transfer Partnership(KTP) Model:

The KTP model focuses on partnerships between academic institutions and businesses to share expertise, research, and innovation. It often involves embedding a researcher in a company to help apply academic knowledge to solve industry problems.

Example, A university researcher working with an agricultural firm to improve crop yields using new technology.

MODELS OF TECHNOLOGY TRANSFER

5. Research Model.

This model is centered around collaborative research initiatives where institutions and industries jointly conduct research. The results of research are then transferred for practical applications.

Example. A university and a tech company collaborating on artificial intelligence research.

6. Consultancy Model:

In this Model, experts provide knowledge and guidance to organization or industries. The consultancy may focus on applying existing technologies, solving specific problems, or improving processes.

Example: A university professor advising a manufacturing company on optimizing production processes.

FACTORS THAT FACILITATE TECHNOLOGY TRANSFER

I. Strong Intellectual Property (IP) Framework.

A robust system for protecting intellectual property, such as patents, copyrights, and trademarks, encourages innovators to share their technologies without fear of unauthorized use.

II. Effective communication and collaboration.

Clear communication and collaboration between stakeholders, such as researchers, industry players and policymakers, ensure that the transfer process is smooth and efficient.

III. Supportive Infrastructure.

Facilities such as research labs, innovation hubs and science parks provide the physical resources needed for research, development, and commercialization of technology.

FACTORS THAT FACILITATE TECHNOLOGY TRANSFER

IV. Availability of Skilled Personnel.

Access to skilled professionals, such as engineers, scientists, and business developers, ensures that the technology can be adapted and applied effectively.

V. Government Policies and Incentives.

Supportive government policies, including grants, tax incentives, and funding for Research and Development, create an environment conducive to technology transfer.

VI. Market Demand.

High demand for innovative solutions or technologies in the market motives industries to adopt and commercialize transferred technologies.

LIMITATIONS OR BARRIERS TO TECHNOLOGY TRANSFER

I. Lack of Infrastructure.

Inadequate physical infrastructure, such as research facilities, laboratories, and manufacturing plants, hinders the effective transfer and implementation of technology.

II. High Cost.

The financial costs of acquiring, developing, and implementing technology can be a significant barrier, especially for small businesses or developing countries.

III. Limited Skilled Personnel.

A lack of skilled workers or experts to adapt and operate the technology can impede its successful transfer.

LIMITATIONS OR BARRIERS TO TECHNOLOGY TRANSFER

IV. Limited Market Demand.

If there is insufficient market demand for the transferred technology, companies may be reluctant to adopt or invest in it.

V. Lack of Financial Support.

Inadequate access to funding or financial incentives can discourage investment in technology transfer projects.

VI. Resistance to change:

Organizations or individuals may resist adopting new technologies due to fear of change, lack of trust, or preference for existing systems.

HOW OPEN INNOVATION AND TECHNOLOGY TRANSFER INTERSECT

- Open Innovation often relies on Technology Transfer to share or acquire the necessary technology for innovation.

- Both encourage collaboration and reduce the time and cost of innovation by leveraging existing knowledge and infrastructure.

INTRODUCTION TO OPEN INNOVATION

Open innovation is a paradigm that promotes the use of external and internal ideas, knowledge, and technologies to drive organizational innovation.

Core Principles

1.Leveraging External Knowledge: Organizations actively seek external ideas to complement their internal resources.
2.Sharing Internal Innovations: Sharing non-core innovations with external entities for mutual benefit.
3.Collaborative Development: Partnering with other organizations to co-develop products or services.

Benefits of Open Innovation

- **Accelerated R&D:** Faster development cycles by incorporating external expertise.
- **Cost Efficiency:** Reduced investment in in-house R&D facilities.
- **Market Expansion:** Access to new markets through collaborations.

KEY CHARACTERISTICS OF OPEN INNOVATION

Examples of open innovations

Procter & Gamble's "Connect + Develop" Program: P&G partners with external innovators to develop new products.
- **Open-Source Software:** Companies like Red Hat leverage community-driven software development.

TYPES OF OPEN INNOVATION

1. Outside-in Innovation

•In this model, organizations actively seek external ideas, technologies, and knowledge to address their innovation needs.

•**Examples** include gathering customer insights through surveys or focus groups, monitoring and adopting emerging technologies from startups or research institutions and participating in innovation challenges or competitions.

2. Inside-out Innovation

•This model focuses on leveraging and commercializing internal ideas, technologies, or intellectual property outside the organization.

•Examples include licensing or selling proprietary technologies or patents to external partners or spin-off ventures, creating startup incubation programs to nurture and support internal innovations, or collaborating with external entities for joint commercialization efforts.

TYPES OF OPEN INNOVATION

3. Coupled Innovation

•Coupled innovation involves collaborative partnerships between organizations to jointly develop and commercialize products, services, or technology innovations.

•Examples include research collaborations between companies and universities, joint ventures or strategic alliances to share resources and expertise, or co-creation initiatives with customers to develop customized solutions.

4. Collaborative Innovation Networks

•Collaborative innovation networks refer to networks of individuals or organizations that collaborate and share knowledge to address complex challenges or drive innovation.

•Examples include online innovation platforms that facilitate the crowdsourcing of ideas, knowledge-sharing communities or forums focused on specific industries or domains, or innovation ecosystems that bring together multiple stakeholders to foster collaboration and exchange.

Introduction to Technology Transfer

Technology transfer refers to the process of transferring scientific findings, technical knowledge, or intellectual property from one organization to another to achieve practical application or commercialization.

Key Objectives

- **Commercialization:** Turning research outcomes into marketable products or services.
- **Knowledge Dissemination:** Sharing expertise across industries or regions.
- **Economic Growth:** Stimulating industries by providing advanced technologies.

Example of technology transfer

- **NASA:** Sharing space exploration technologies for commercial use.
- **University Spin-offs:** Academic institutions transferring research findings to startup companies.

Factors Which Facilitate Technology Transfer

1. **Strong Intellectual Property Protection**
   Encourages innovators to share their technologies without fear of exploitation.

2. **Collaborative Ecosystems**
   Facilitates partnerships through science parks, innovation hubs, and incubators.

3. **Government Support**
   Policies, subsidies, and grants that promote technology development and adoption.

4. **Market Readiness**
   Clear demand for the technology in the target market.

5. **Infrastructure and Resources**
   Availability of facilities and skilled labor to support technology adoption.

6. **Clear Communication**
   Ensures alignment of goals and expectations between parties.

Limitations or Barriers to Technology Transfer

- **Cultural Differences:** Misaligned organizational cultures hinder effective collaboration.
- **Regulatory Hurdles:** Complex legal and regulatory requirements cause delays.
- **Funding Constraints:** Limited financial resources impede technology development and adoption.
- **IP Ownership Issues:** Intellectual property rights disputes frequently stall agreements.
- **Technological Gaps:** Insufficient technical expertise prevents successful implementation.
- **Geographical Barriers:** Physical distance complicates coordination and collaboration.
- **Resistance to Change:** Organizations resist adopting new methods or systems.
- **Lack of Market Awareness:** Insufficient understanding of market demands leads to misaligned innovations.

END OF LECTURE