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## COUNTRY PRESENTATION



**Mr. Asif Iqbal**  
Assistant Director  
IPO-Pakistan

**Ms. Saba Khan**  
Deputy Director  
Technology Incubation Center,  
National University

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## OVERVIEW

- × Organizational Structure of IPO-Pakistan
- × Function and Role of IPO-Pakistan
- × Technology development efforts by Pakistan
- × Technology Transfer in National University of Science and Technology.
- × Challenges in University-Industry collaboration in technology transfer

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## ORGANIZATIONAL BASE

### Vision

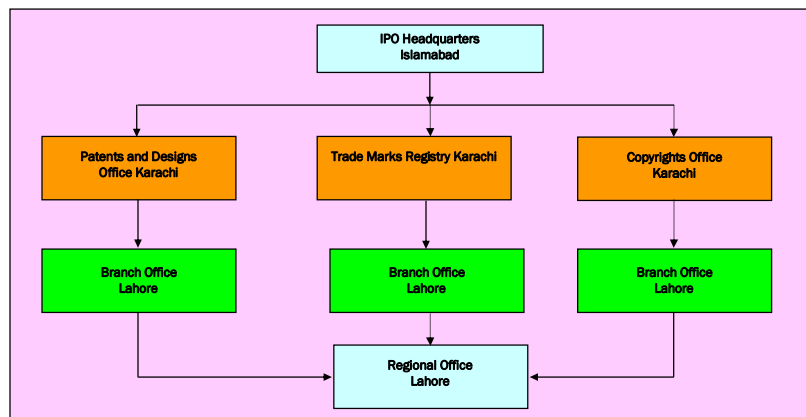
To put Pakistan on the IP map of the world as a compliant and responsible country by protecting and promoting intellectual property rights.

### Mission

Integration and up-gradation of IP infrastructure for improved service delivery; increased public awareness and enhanced enforcement coordination for achieving the goal of being an IP based nation.

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## OFFICES OF IPO-PAKISTAN



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## CORE FUNCTIONS OF IPO-PAKISTAN

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- × Integrating IP Management
- × Improving Service Delivery
- × Enhancing Public Awareness
- × Coordinating Enforcement

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## GOVERNANCE STRUCTURE OF IPO-PAKISTAN

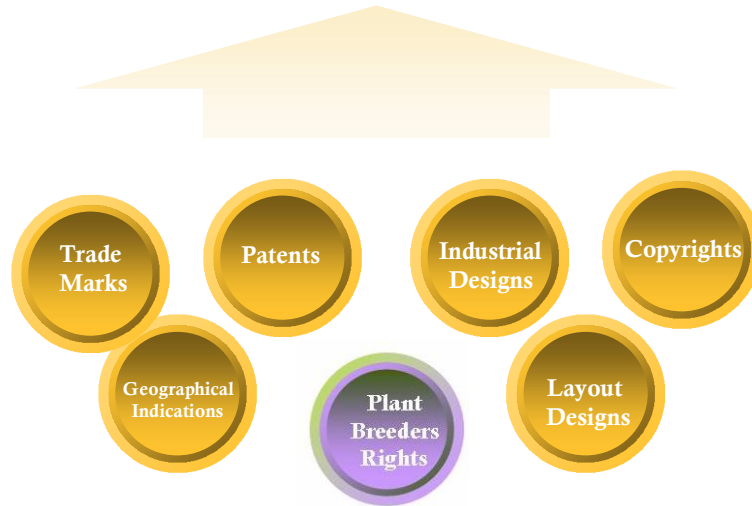
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- × **IPO Policy Board**
  - + **Chairman**
  - + **Federal Secretaries**
  - + **Corporate Executives**
  - + **Director General/Chief Executive**

Public – Private Partnership:  
A new paradigm of governance in  
Pakistan

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## INTEGRATED IP MANAGEMENT IN PAKISTAN



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## INSTITUTIONAL LINKAGES

- × R&D Institutions
- × Training Institutions
- × Universities and Academia
- × District Bar Associations
- × Federal Judicial Academy
- × Chambers of Commerce and Industry
- × Student Researchers
- × SMEDA

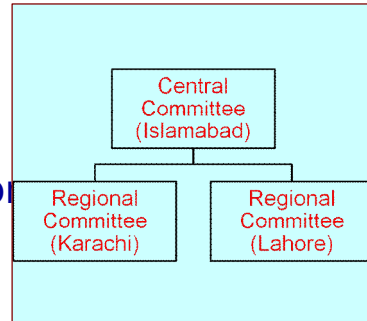
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## STRUCTURED ENFORCEMENT COORDINATION

- × Policy Board Interface  
(Policy Level)
- × Organisational Interface  
(Supervisory Level)
- × Enforcement Coordination Committee Interface  
(Operational Level)

Enforcement Committee Members

(IPO, Police, Custom, FIA, PEMRA, NBF)



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## GOVERNMENT EFFORTS IN MAINSTREAMING IP IN PAKISTAN

- × Creating a separate regulatory body for IP i.e. IPO-Pakistan in 2005
- × Placement of IPO under the Cabinet Division;
- × Public-Private Partnership in the Governance structure of new Organization;

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## GOVERNMENT EFFORTS IN TECHNOLOGY DEVELOPMENT

- ✘ Patent Advisory Cell in Higher Education Commission which is working on promotion on Patent Culture in Universities.
- ✘ Pakistan Council of Science and Industrial Research (PCSIR) is an organization of the government which works on promotion of science and technology in the country.

*"To conduct R&D work on problems faced by the industrial sector and maintain linkages through seminars, workshops, publications, and provision of assistance to academic institutions."*

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## GOVERNMENT EFFORTS IN TECHNOLOGY DEVELOPMENT

- ✘ Pakistan Science Foundation is another organization of government works primarily on development of science and technology
- ✘ Foundation provides grants to universities and other R&D organizations for projects undertaken by individuals or groups of scientists.
- ✘ Ministry of Science & Technology organizing awards functions for young scientist and preparing list of members scientists.

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## **EFFORTS BY UNIVERSITIES IN TECHNOLOGY DEVELOPMENT AND TRANSFER**

- ✘ Culture in Universities is getting changed--focusing on creation, protection and transfer of IP but very very slow paced
- ✘ Establishment of Technology Incubation Centers in different universities in Pakistan
- ✘ The TICs works on technology transfers and entrepreneurship development through inventions by Universities BUT TICs still need to build their own capacity in different aspects on technology transfer

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## **CHALLENGES IN INDUSTRY-UNIVERSITY COLLABORATION**

- ✘ Concept of Industry- University collaboration in Pakistan has yet to flourish
- ✘ Most of researches are Basic researches
- ✘ Market value of researcher is calculated on the basis of publication of papers and NOT number of Patents
- ✘ Inventions goes waste due to lack of commercial application
- ✘ Lack of Industry- University collaboration is leading to reinvention of wheel
- ✘ Awareness about importance of commercialization of Patent

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## **EFFORTS BY IPO-PAKISTAN TO PROMOTE INDUSTRY-UNIVERSITY COLLABORATION**

- ✦ Seminars in Universities on importance of Patents and its commercial utility
- ✦ Offering trainings to relevant University officers in Patent Drafting
- ✦ Establishment of IP advisory desk in Karachi Chamber of Commerce & Industry is a recent initiative by IPO-Pakistan
- ✦ Opening of a separate Media department having seasoned professionals which is extensively working on IP awareness

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**National University of Sciences and  
Technology Pakistan  
UNIVERSITY- INDUSTRY LINKAGES...**



## HISTORICAL PERSPECTIVE

- Established 1991
- Awarded Charter 1993



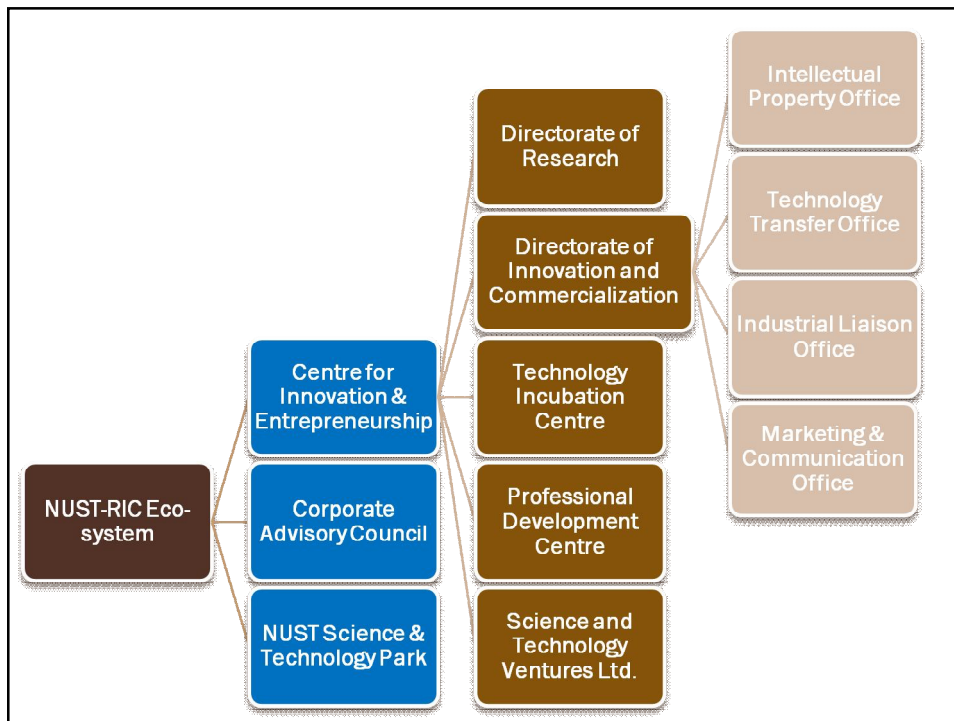
## MISSION

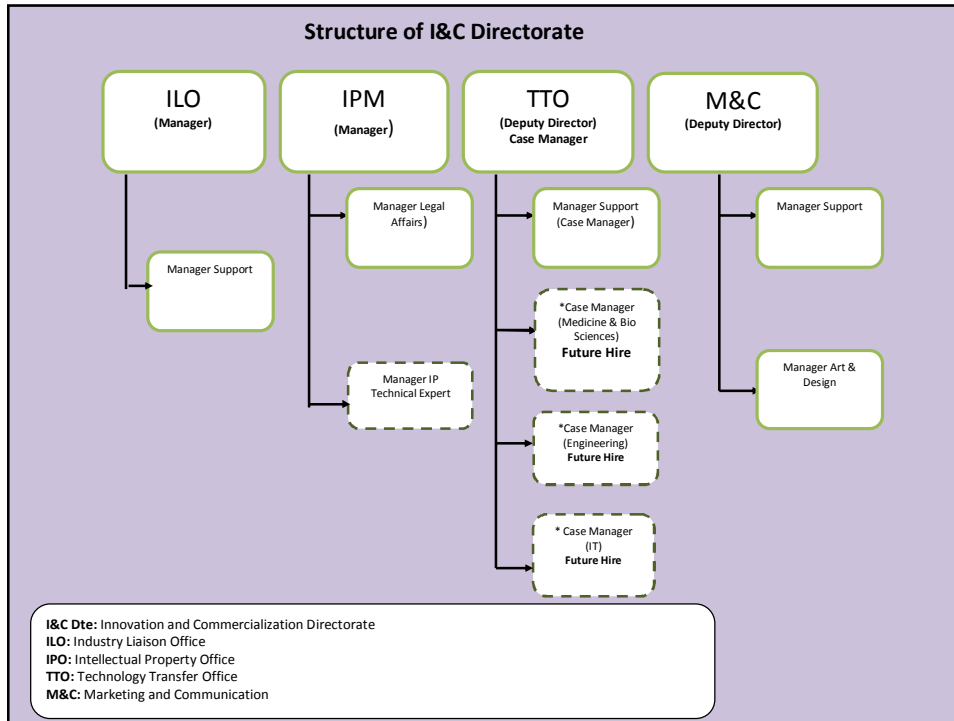
To Develop NUST as a  
**Comprehensive, Research-led**  
University with a focus on  
**Technology,**  
**Innovation and Entrepreneurship**



# HEC Initiative

- ❑ Establishment of Offices of Research, Innovation and Commercialization (ORIC) in universities
- ❑ Incentive: 15 % university overhead if the research proposal has come from ORIC






# INTELLECTUAL PROPERTY OFFICE

- **IPM** will be established as Intellectual Property Office within the Innovation & Commercialization Directorate
- **IPM** will be responsible for coordination with TPO and other relevant departments in the organization to ensure the effective management of the intellectual property

| Summary NUST Patents              |                 |
|-----------------------------------|-----------------|
| Total filed Patents by NUST       | Fourty Two (43) |
| Approved (Patents Local)          | Seven (07)      |
| Approved Patents (International)  | Two (02)        |
| in Process Local                  | Eight (11)      |
| In Process international          | Two (02)        |
| Rejected                          | Eleven (11)     |
| Examination Reports Not Addressed | Eight (08)      |
| Revoked                           | Two (02)        |

# Technology Transfer Office



- Technology Transfer Office (TTO) is a specialized unit within a university or research institution that is responsible for managing intellectual property (IP) and facilitating the commercialization of research and development (R&D) into marketable products and services.
- TTOs typically handle the entire process from identifying potential commercial opportunities to negotiating licenses, patents, and other legal agreements with industry partners.

## Industry Liaison Office



- ❑ NUST-ILO develops and maintains industry linkages and identifies specific industry partners for the ongoing research at NUST.
- ❑ It gauges industry needs and processes match making with NUST Institutions to solve industrial problems

## Technology Incubation Centre



- ❑ NUST pioneered the first Technology Incubation Centre of Pakistan in 2005.
- ❑ 7 incubatees have graduated from TIC.
- ❑ NUST-TIC is now expanding to accommodate virtual incubatees as well.
- ❑ Catalysts from within the diversified subject matter expert base of the University are used to provide consultancy to incubatee companies.

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TURNOTECH: Revenue of **Rs. 100 million in 2010**. The enterprise employs over 40 employees and is pursuing business expansion internationally.

## Science & Technology Ventures Ltd.



- ❑ ST Ventures is a holding company of NUST which acts as a platform for the creation of new enterprises by commercializing R&D output for successful businesses.

## Corporate Advisory Council



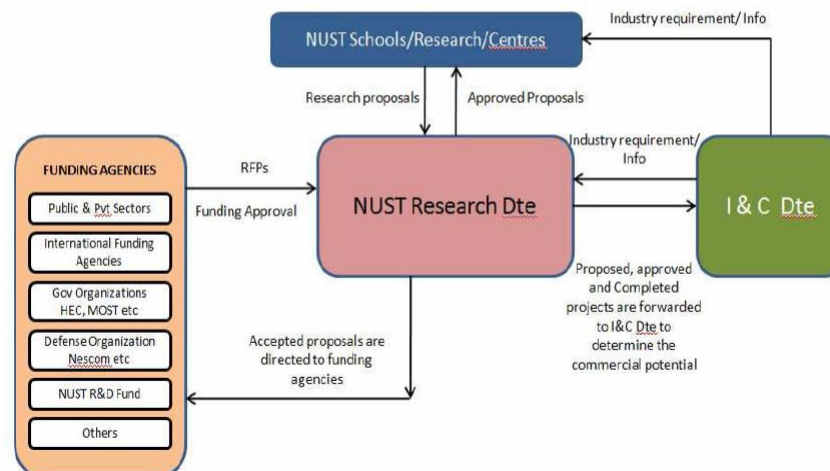
- ❑ Combines thought-leadership from 11 key sectors across the national economy.
- ❑ Aims to bridge gap between academic research and business requirements
- ❑ Creates effective linkages between NUST apparatus and Industry initiatives

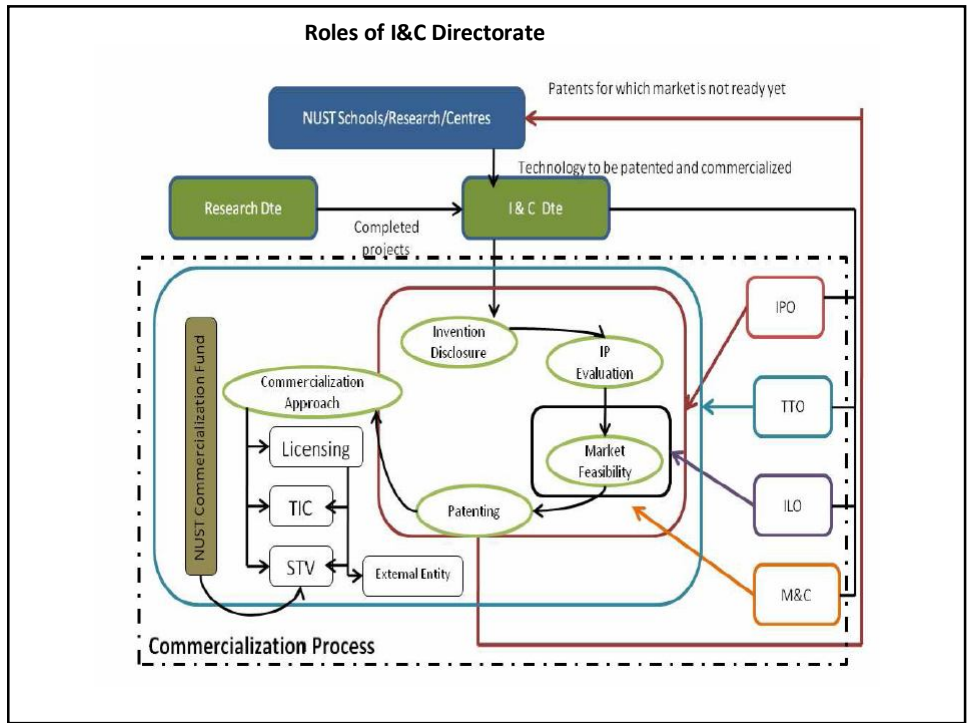
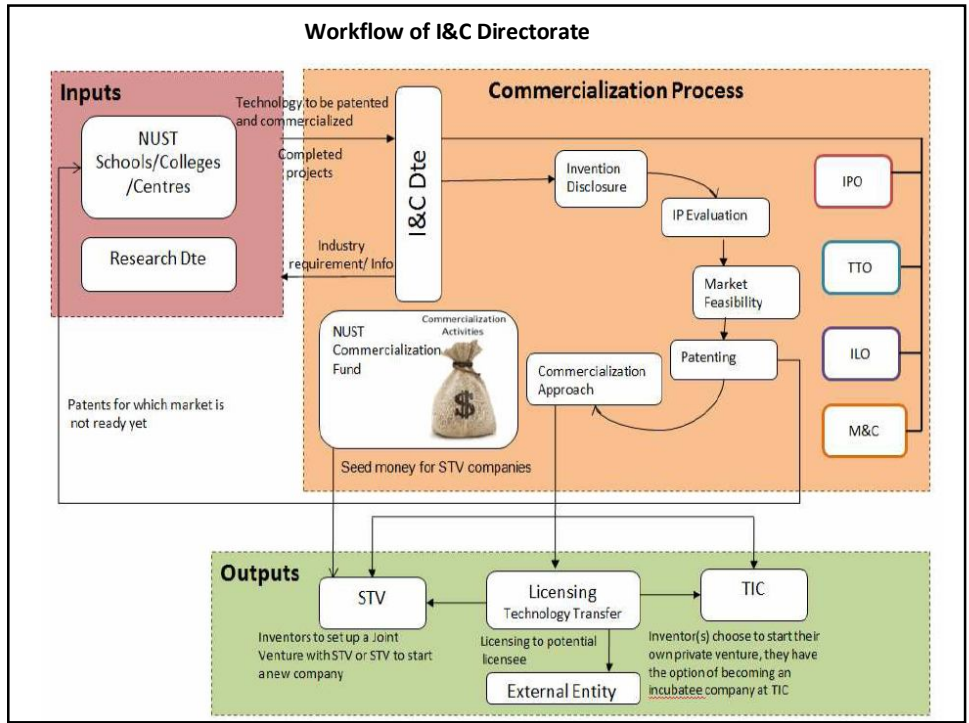
## NUST Science & Technology Park



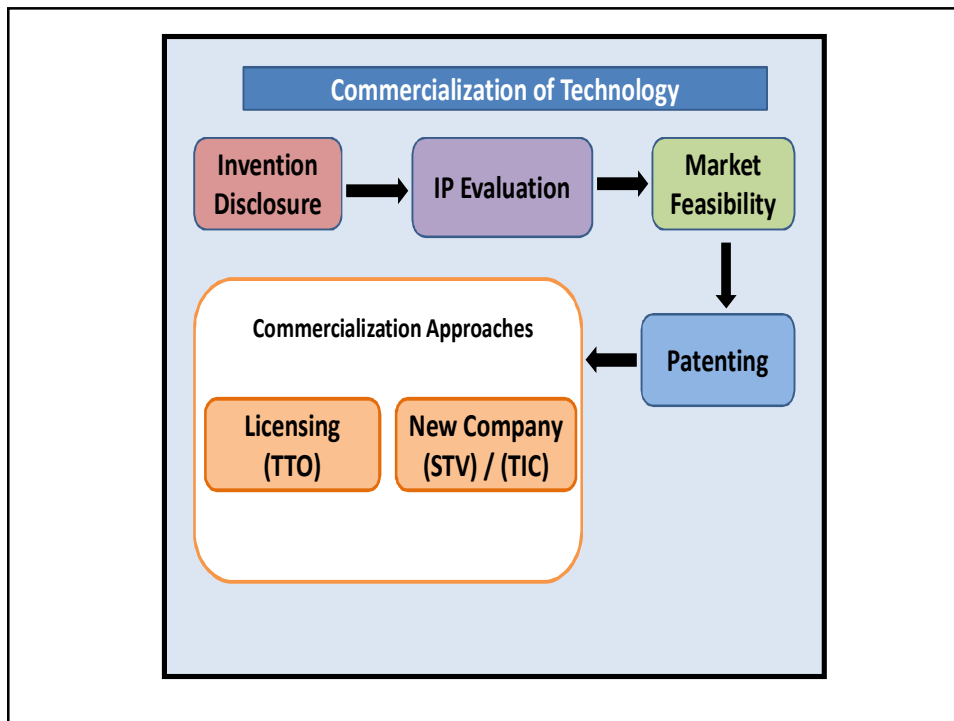
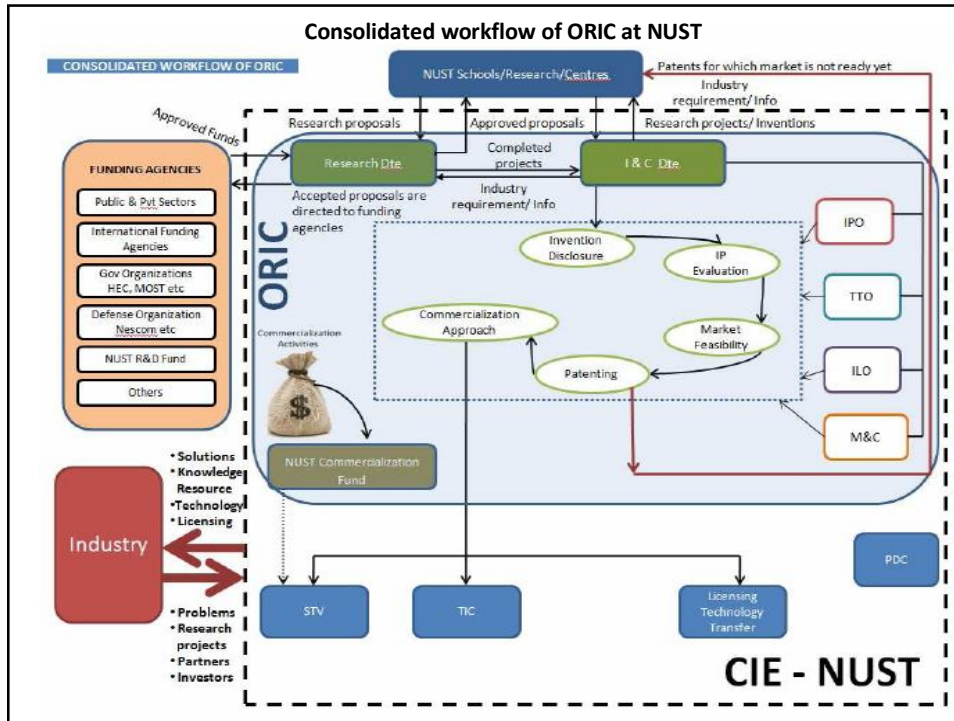
- ❑ Plan for establishing a state-of-the-art Science and Technology Park for the social & economical uplift of Pakistan.
  
- ❑ The park would consist of:
  - R&D Centre
  - Manufacturing & Resource Centre (MRC)
  - Rental Services Unit
  - Tertiary & Vocational Education Institute
  - Business Development Unit
  - Science Centre
  - Corporate Finance & Management Services Unit
  - Support and Recreational Facilities

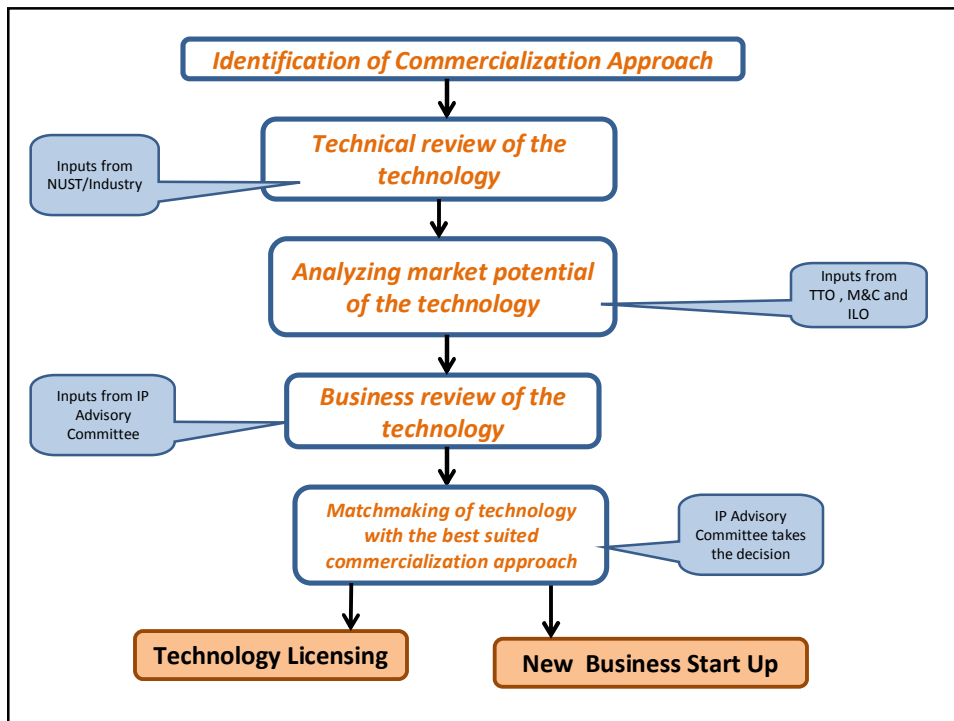
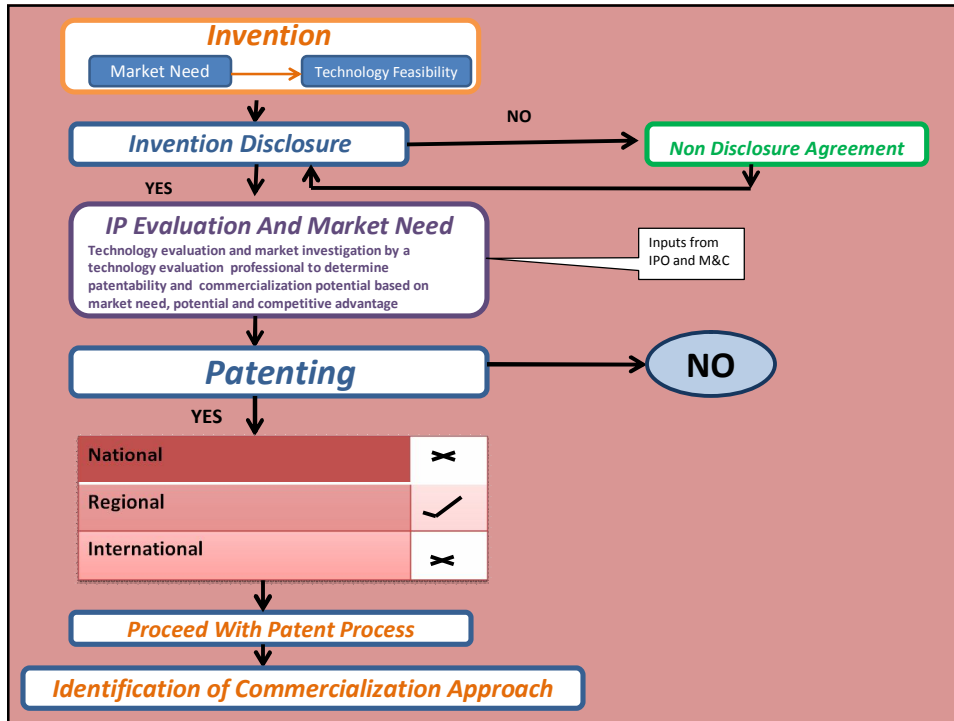
## Work Flow of Research Dte

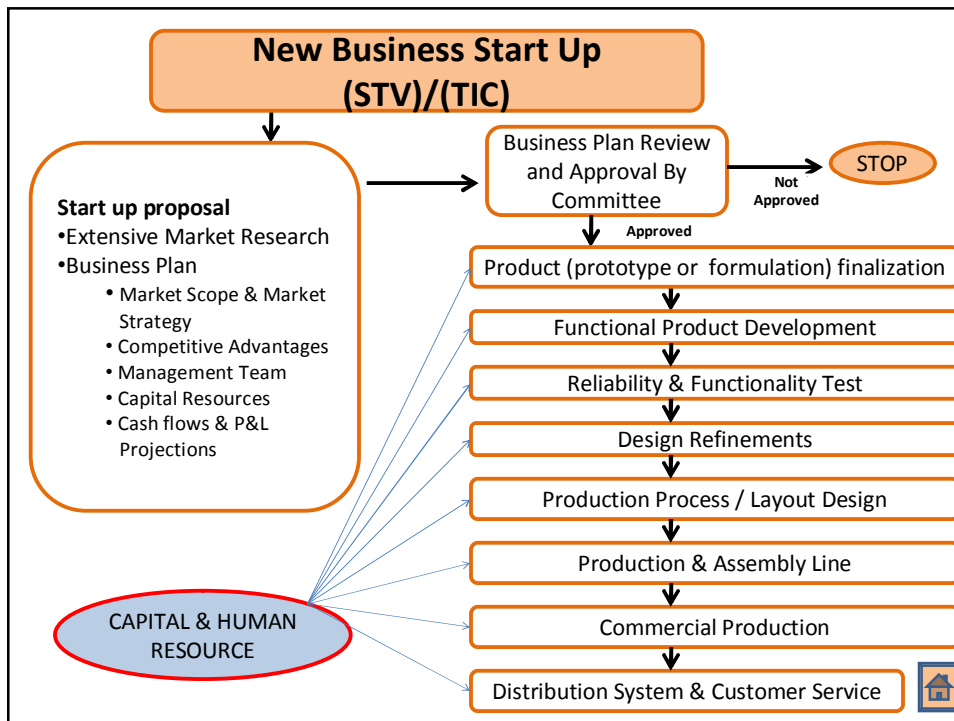
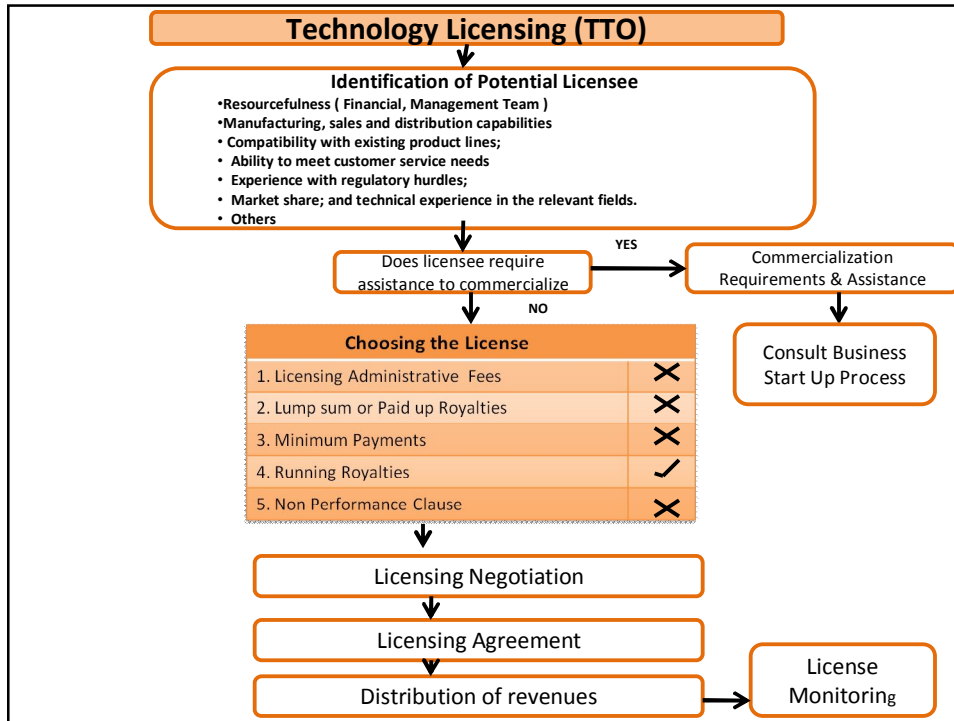












# Challenges that University is Facing

- Delivering Integrated Solutions to Industry
- Alignment of Academic R&D with Industry's Needs
- Industrial Problem Identification
- Commercial Scale Implementation of Laboratory Scale Solutions
- Lack of Incentives for Faculty
- Lack of Incentives for Industry
- Stretched Funding Process
- Mismatch in Timescales Followed by Industry and Academia
- Pool of Experts
- Conflict of interest

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## FOOTBALL SHAPE ANALYSIS AND WEIGHING SOLUTION

A collaborative R&D project between  
School of Mechanical & Manufacturing Engineering  
National University of Sciences and Technology  
And  
Anwar Khawaja Industries (Pvt) Ltd, Sialkot



*High accuracy with minimal observation time are critical for effective football quality control*

The Football Shape Analysis and Weighing Solution provides

- Accurate means of measuring football circumference and sphericity deviation
- An observation time of 6 seconds per football that enables manufacturer to deploy solution for bulk quantities.
- Simultaneous weighing of football integrated into shape analysis process to reduce the process overhead of manual weighing during quality control

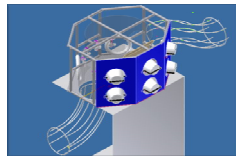


Figure 1. CAD based view of the functional portion of the measurement system

*Vision sensor based technology provides fast and accurate means of measuring football circumference and sphericity*

Cutting edge vision sensor based technology developed at SMME is simply the most economical and most reliable way as it ensures the most accurate results in real-time with minimal maintenance costs



Figure 2. An illustration of different phases of image analysis employed by the system

*Assembly Line Friendly Integration Design*

The Solution has gravity based ball intake and rejection system which makes it ideal for integration within the assembly line. It also has buffer for the incoming footballs that insures a steady rate of observations per minute. Solution archives a comprehensive databank of images for each rejected ball.



Figure 3. A fully deployed system

*System Highlights*

- > Up to 20 times more accurate than FIFA requirements
- > 8 sec observation time and multi-size adaptive design
- > Gravity based ball flow minimizes mechanical wear
- > Includes Image database of faulty footballs sorted by time and date of observation
- > Easy to use calibration software



Figure 4. An array of multi-angular images used for Shape Analysis

# Engine Blow-by Monitoring System

**Client:** Millat Tractors

**Objective:** Design and development of real time engine blow-by monitoring system for engine.

**Importance:** Engine Blow-by testing is very important for the engine manufacturers. This system is used to measure Engine Blow-by and the data is logged into a computer. Piston rings wear and tear can be diagnosed with this system.

**Status:** Completed

