Nurturing Innovation and Entrepreneurship in University-ecosystem

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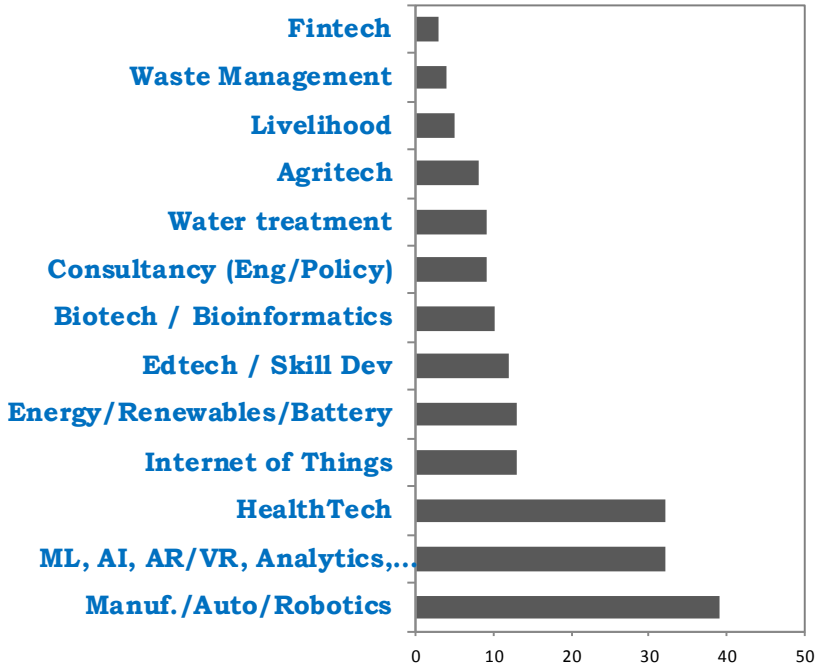
Message to Youngsters

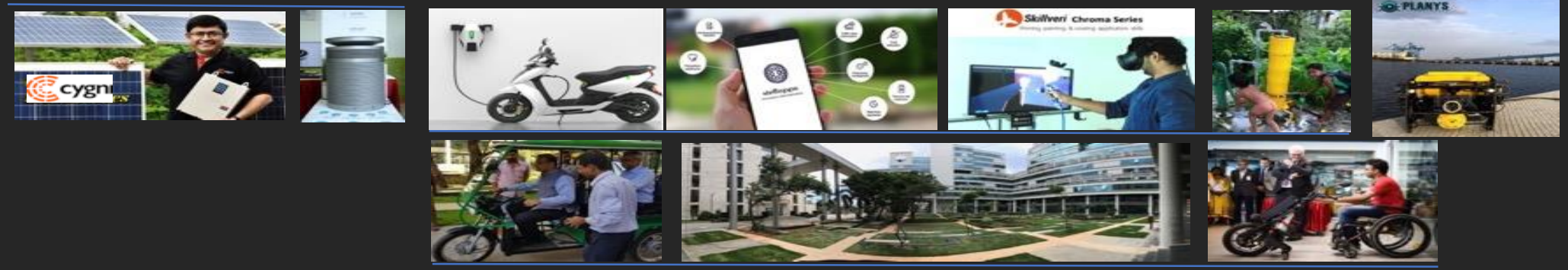
- Till 2010, best students from IITs preferred to go abroad for higher studies on graduation
  - Today they prefer to join / start a start-up
    - They know success is very difficult
    - They need to work much harder than in any other job or academic pursuit
      - Much harder than they have ever done as a student: 18 hours x 6 days
    - Chances of success is low (very high risk)
    - They need all round abilities (they have to keep learning)
    - Would practically get no money for first couple of years
  - But they also know that they will be their own masters
    - Experience will be far more valuable than that in a job or academic career
    - Industry will consider them highly valuable, even if they fail

So we built a Deep-tech Incubator

- In every engineering discipline
- Won almost all national Entrepreneurship Awards



India's leading deep-tech startup hub



Empowering Innovation & Deep Tech driven Entrepreneurship to address national challenges through successful, self-sustaining companies that are redefining markets

IITM Incubation Cell, plus Rural Technology Business Incubator, MedTech Incubator and Bio-Incubator

- 200+ incubated companies in over 10 years
  - Focus on deep-tech companies
- Current value exceeds ₹7000 Crores
- Incubator has shares worth ₹100 Crores

Innovation ~~is a~~ culture at IITMRP

- *Before we dwell further on entrepreneurship, let us talk a bit about R&D and its translation to industry*

Translation

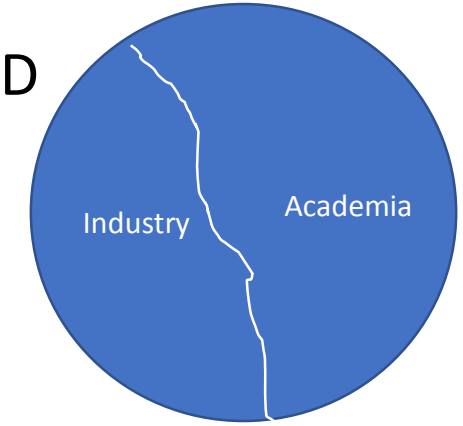
Independent India built several high quality Educational S&T Institutions

- High Quality Institutions in India: IISC, IITs, ISERs …
- Faculty came from the best institutions around the world
  - They are amongst best teachers
  - Their students make a mark all over the world
  - Focus on basic R&D: significantly enhanced over the years
- But minimal Impact on industry in early days
  - Little Translation of R&D: Industry continued to import most technologies
  - Impact on industry therefore limited to getting trained manpower
    - More for manufacturing and management and less for R&D

Translating R&D to Commerce

- Started with a situation
  - Academia belief: Industry is not interested in R&D - they only want to import
  - Industry belief: Academic R&D is all about publishing – no products possible

- Breaking this stalemate
  - Academia with a vison to make a difference: need to sell the vision to top management -- not through Industry R&D
  - Have to have commitment to work with industry to do whatever required to get the product to market
    - Fully complement each other
    - Requires regular formal-informal interaction



Technology Translation Mechanism

- Licensing technology to established companies
  - Technology would rarely be fully ready
  - Would often require efforts to convert into a product: manufacturable, 24 x 7, acceptable to customers, make money
- Through an incubated start-up
  - Create new products: disrupt existing solutions / tech eco-system
  - When established company would not be ready to take risk and create market

Stages of Technology Development and Commercialisation

- Developing Tech that need long time, large funding and carry high risk
  - Carry it out in R&D lab of academic institution with Government / public / CSR funding
    - Till it reaches a stage, where it is ready to be commercialised
  - Only at this stage carry out technology transfer or incubate a company
    - Entrepreneurs could work in R&D Labs from the beginning, with an intent to spin-out a start-up at the right time

IITMRP is at their Heart of Innovation

To create an Entrepreneurial Culture in a University

Needs Sensitization Drive: Create Excitement

- An effort to create entrepreneurial culture
  - A Culture of making / building things that work
    - As against attending classes, doing routine lab experiments doing homework and writing exams
  - Centers for Innovation, Tinkering Labs, Entrepreneurship Cells
    - Domain specific centers and clubs like Robotic club, auto-club, “good” software club, IOT club …
    - Run entirely by students: institute provides only space and some funds
      - Twenty-four-hour clubs
      - Ensure security and safety, but no faculty supervision

Start-up as a serious Career Option

- Talks by young entrepreneurs, Experiential talks, Talks of how Indian universities have built very successful enterprises …..
  - Hold innovation challenges, hackathons, competitions
  - Visits to start-up exhibition, Incubation Centers

- Will generate excitement for startups
  - Will help youngsters come to incubator to build a start-up
  - but plays a minor role in creating successful start-ups
  - Very few successful start-up emerges from Innovation centers, tinkering labs, competition, prizes

Bring back the youngsters down to earth

- Next Steps: Bring down the excitement and get serious
  - Excitement will bring in students / faculty with tall promises of huge success
  - But does not tell that entrepreneurship is a very difficult career option
    - Success can be big, but very few succeed: High-risk career option
    - Success takes a long time and very-hard work: learn to live with failures
      - 20 hours of disciplined work a day with very little immediate return
  - An entrepreneur needs to be master of multiple trades
    - Product idea plays smaller role
    - Build products, Manage people (HR), Manage finance (most difficult), Assess Market, Manufacture products and services which customer like, Sell, Make margins with each sell, Raise money (comes later)
  - Understanding finance is key: lacking all over the Indian universities

Incubator's Key Tasks

- Get the youngsters prepared for long-hard work
  - And not to provide easy funds to make the start-up process easy
- Space, services, seed funds are important
  - But unless an incubate prepares oneself for hard grind, the easy-funds and services hurt the start-up more than it helps
  - Prepare the incubate for the tougher career option
    - Get the person to push herself hard – provide support in small bits only if the person is pushing hard and getting somewhere
  - Extensive training by people who have run or directly guided business
  - Extensive mentoring required by people with successful business experience

Preparing a Start-up for long-haul

- Start-ups are likely to succeed only if an entrepreneur is prepared for long-haul and in position to take risks
    - Should be free of family obligations for a few years and has family support
  - Ready to work hard, do right things and take each failure as a lesson to move ahead
  - Re-boot after failures, gather the pieces and reengage in another battle
- Provide training: towards driving a venture to success
    - Young entrepreneur will take time to mature and will require more hand-holding / training
    - Alumni who come back after three to four year's experience are in better position
    - student-faculty/alumni groups are ideal starting points
- Incubators should offer / leverage available training (on/off-line)
    - Short courses (few hours long): can do one or two modules every week
    - Not overload the entrepreneur with excessive classes: should be slow-paced
    - Taught by persons who are experienced entrepreneurs themselves, yet captivating

Multi-dimensional training

- Training may include
  - Concept to product development
  - Understanding of the market: Is the product needed? Who will buy the product? How much will they pay?
  - Prototype to Manufactured product: will it work 24 x 7? What will it cost to manufacture? Product quality: servicing a product; cost of service
  - Understanding Company's finance: what is Revenue? What are costs associated with Revenue? Working Capital issues? Capital expenditure? fixed costs? Depreciation? Interests costs? R&D costs? What is profit? Balance sheet? Cash-flow statement? Profit and Loss statement?
    - Managing Cash: does one pay salary at the end of month?
    - Where can one raise money? How does one raise money?
    - Where can one borrow money?

Training (continued)

- Rules and Regulations governing an Indian company
- Deriving Profits from Revenues
- How does one manage team: HR issues and retaining people: People could be a strength of a company and people may be its weakness -- team-spirit and leadership
- Company branding and reputation: Company ethics: avoiding short-cuts; Managing difficult-times

- Institute may create E-cells, run entirely by students
  - E-cells can take up role of sensitization and some training
  - for early support/guidance/training to students aspiring to create ventures, have innovative ideas

Domain expertise

- Start-up would need to get deep into the domain: will have to compete with established companies
  - Products may be copied unless they have deep technology embedded
- How does a start-up acquire such deep-knowledge?
    - It may take considerable time and much harder work than one is used to as a student
  - Motivated team-members help
  - Faculty involvement in start-ups helps: but never impose or influence a start-up to take on a faculty
- Start-ups with known technologies need to excel in delivery / costs: not easy

Incubates will require strong mentors

- Mentors should be from Industry
  - Preferably be leaders of successful enterprises
  - Some alumni with long years of industry-experience
- Preferably one to one mentorship: one mentor assigned to a company
  - Mentor must be acceptable to entrepreneurs
  - Never impose a mentor on a company
- Mentors themselves must be pure advisors: they advice not decide
    - Entrepreneurs may chose to listen to the advice or do what they feel best
  - Mentors can also provide feed-back to Incubator about company-progress
    - If incubator provide any kind of funding, they may insist that company takes up some mentors of their choice from the pool of available mentors

Pre-incubation and early mentorship

- Desirable that it creates a pre-incubator
  - Some support to a potential start-up which is not yet ready as a start-up
  - Do NOT Incubate a start-up till it is ready: make it selective to become incubate
  - Provide opportunity for potential companies to learn from each-other and other start-ups
- Important to gauge whether aspiring entrepreneurs are likely to succeed : early mentorship is crucial
  - Are entrepreneurs currently in position to take risk?
  - Do their family need them to have regular income?
  - Have they done enough homework?

A successful Incubator needs to

- An incubation committee to decide whether to admit a start-up
  - Incubator's decision must appear to be fair: students will not come otherwise
    - ZERO external influence : ZERO say by VCs and Deans
- Incubation support should be without any funding commitment
  - Provide shared space, business support and financial services, company secretary, legal, patent, HR; and network to industry/investors
- Startup should have a mentor (technical/business) assigned to them
  - General mentoring program doesn't add significant value, as much as at individual one to one level
  - Involve successful industrialist entrepreneurs

Funding a start-up

- No easy money for Start-ups: reduces its chances of success
  - Funding at all levels should be difficult
- Funding committee
  - have people with venture-fund experience, industrialists, CEO and professor in-charge of incubator plus two (preferably who have worked with industry)
    - Avoid deans / administration
  - Seed grant: ₹5 lakhs or maximum ₹10 lakhs
  - Loans up to ₹25 lakhs with low-interest (6% to 7%)
  - Beyond this: company must raise funds form Angel networks
- Incubator to facilitate introduction to Angel and venture-funds

Evaluate Incubator performance every year

- Not by the programs they organise towards sensitisation, training and Networking
- Evaluate by
  - Number of incubate
  - Revenue that these start-ups generate every year
  - External investments raised by start-ups: total valuation of all companies
    - Incubator's share in the total value
  - Employment generated by the incubated start-ups
  - How fast they become self-sustainable, except in venture-financing
- Poor performance: Change CEO and key employees and Professor in-charge

Finally, Innovation thrives

- When three sets of people come together in an informal / formal setting
  - Faculty member with WIDE knowledge
  - Industry person who know how to manufacture and sell a product
  - And a youngster, who does not know that “it cannot be done”
- IITM sets up a Research Park, adjacent to IITM, and invites industry to set-up their R&D at the Park

IIT Madras Research Park

- 1.2 million sq ft + 250K parking lot
  - Total Spent: ₹500 Crores: ₹107 Crore Gov / alumni grant plus bank-loan of ₹380 Crores
    - ₹350 Crores loan cleared
  - Makes ₹30 Crore cash-profit every year
  - Houses R&D for 85 companies

- IITMRP is home to IITM Incubation Cell