

Indian Institute of Information Technology, Design and Manufacturing, Kancheepuram

Pioneering Design-Centric Engineering Education in India

Indian Institute of Information Technology, Design and Manufacturing, Kancheepuram (IIITDM) is an Institute of National Importance under Ministry of Education and setup in the year 2007 with a vision to produce a new breed of engineers to support the competitiveness and growth of the Indian manufacturing sector with knowledge-intensive and creative products and processes. In other words, a model of engineering that synthesizes the best practices of IITs (Technology), IITs (IT), and NIDs (design). IIITDM is also strategically placed in the proximity of the industrial clusters in Chennai and UNESCO heritage sites like Mahabalipuram and Kancheepuram.

In 2009, IIITDM under the mentorship of IIT Madras, introduced an inter-disciplinary and design-oriented engineering curriculum in three streams - mechanical, electronics and computer engineering. In 2014 a major enhancement was done to promote design-centric engineering education. Some of the unique practices implemented in this enhancement include a series of design and management courses from semesters 1-8, vertical integration of the design and management courses between semesters 3-6 to enable students to identify and translate ideas to PoCs, industry open house events (EHIPASSIKO) once every semester to expose students and their concepts/PoCs to industry experts, a 5-month internship at the end of the 6th semester, and a framework to assess design competence. In 2016, IIITDM launched the world's first undergraduate program in smart manufacturing. These practices along with the development of innovation and incubation ecosystem have been instrumental in IIITDM being placed in the Band-A (Rank 11-25) among the Institutes of National Importance in the Atal innovation ranking (ARIIA 2020). The undergraduate and dual degree programs have got the attention of corporates such as AMD, Daimler, MathWorks, PayPal, Saint Gobain, Samsung, TAFE, Trimble, TVS Motors and several technology startups. IIITDM students have also got admissions into graduate and Direct-PhD programs in institutions such as Dartmouth, Univ of Minnesota, Umass Amherst, Columbia Univ, Trinity College (Dublin), TU Delft (Netherlands/Denmark), NTU/NUS Singapore, IISc, IITs & IIMs.

The disruption unleashed by COVID-19 and the National Education Policy (NEP) launched by the Govt. of India provide strong tailwind to the design-centric model of engineering education pioneered by IIITDM. IIITDM used the COVID lockdown situation to further review its program with reputed experts from industry and academia and create a roadmap to advance interdisciplinary design and innovation. Design-centric education is fundamentally about creating a new learning environment that nurtures curiosity and calls for a more unified approach to development of mind-body-morality, aspects that are fundamental to the NEP. The new undergraduate programs in IIITDM create more options for engineering students to get different levels of maturity in Product Design or get minors in a complementary branch of engineering or science. In the emerging context, where the manufacturing industry in India is re-inventing itself to embrace digital technologies (industry 4.0), and plug the supply chain gaps to create a self-reliant India, IIITDM and its students are poised to play a pivotal role.

Indian Institute of Information Technology, Design and Manufacturing, Kancheepuram, Chennai

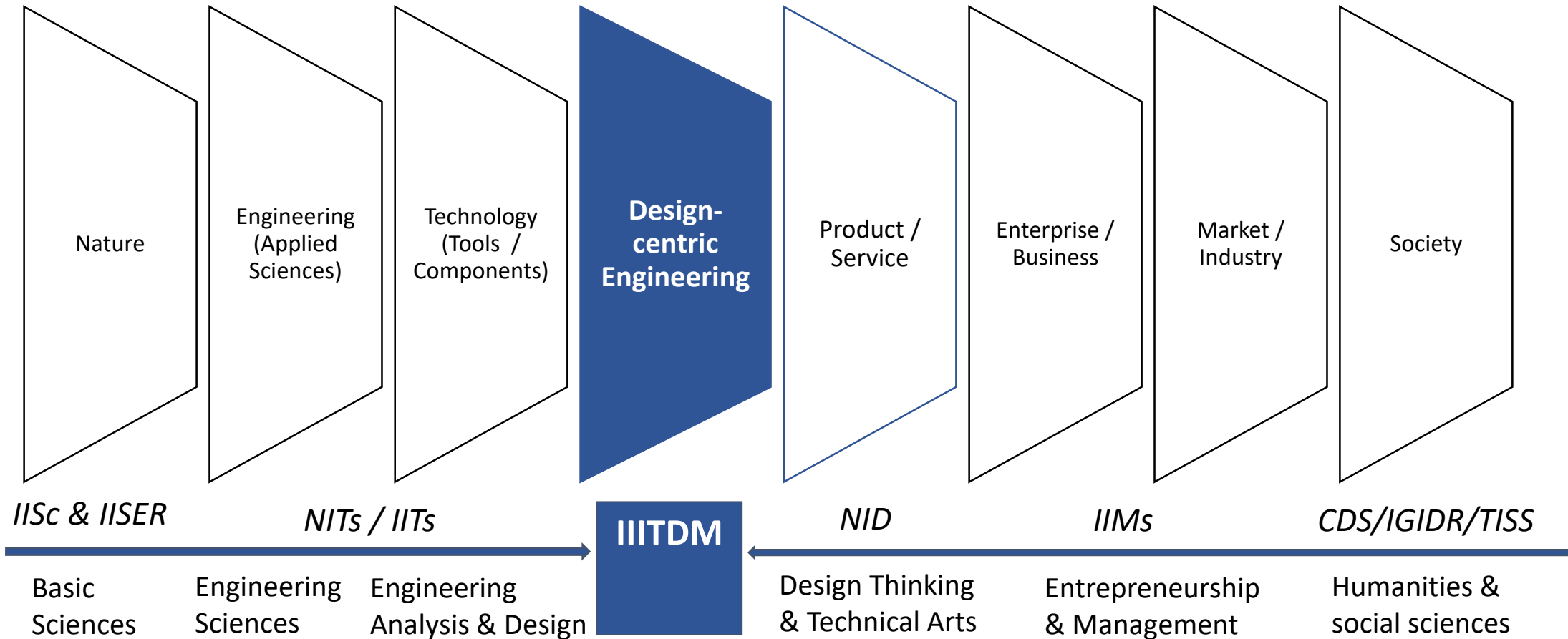
(An Institute of National Importance)

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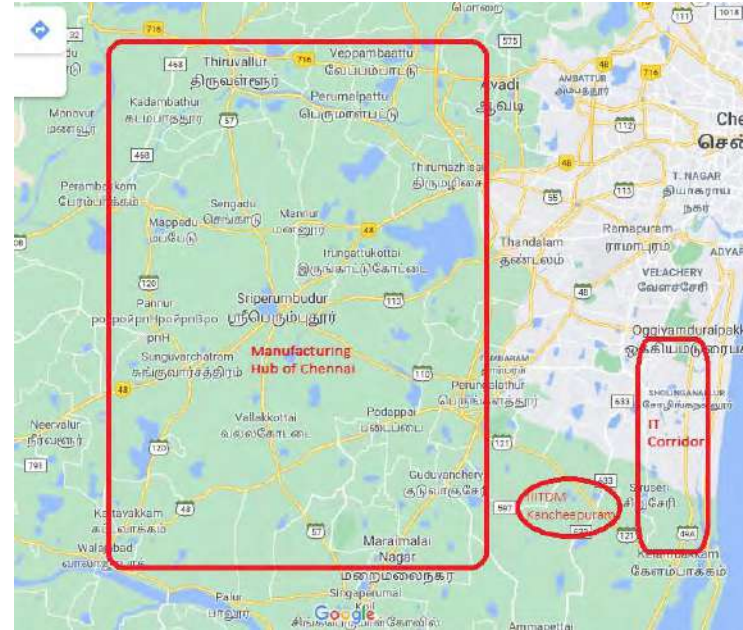


INDIAN INSTITUTE OF INFORMATION TECHNOLOGY,
DESIGN AND MANUFACTURING,
KANCHEEPURAM

IIITDM is uniquely positioned among CFTIs, and well-prepared to implement the National Education Policy



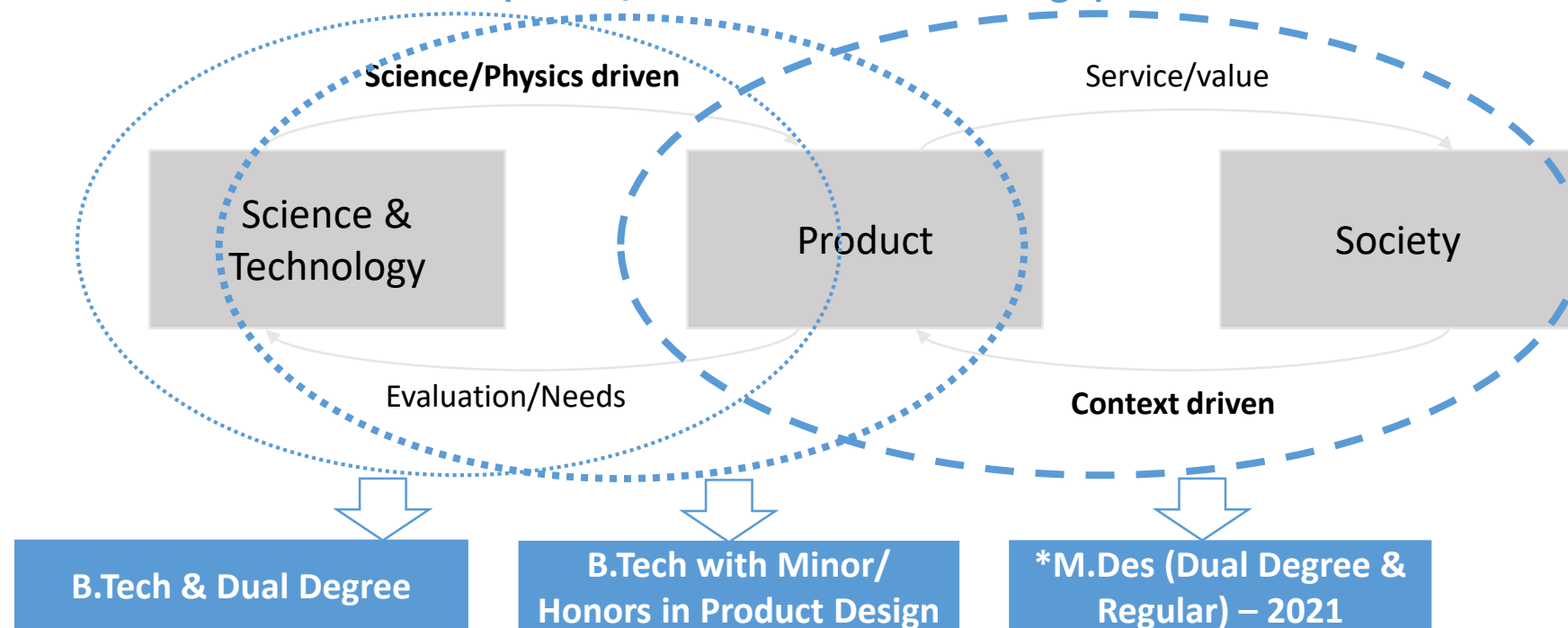
A design-centric education model that blends STEM with Humanities & Social Sciences



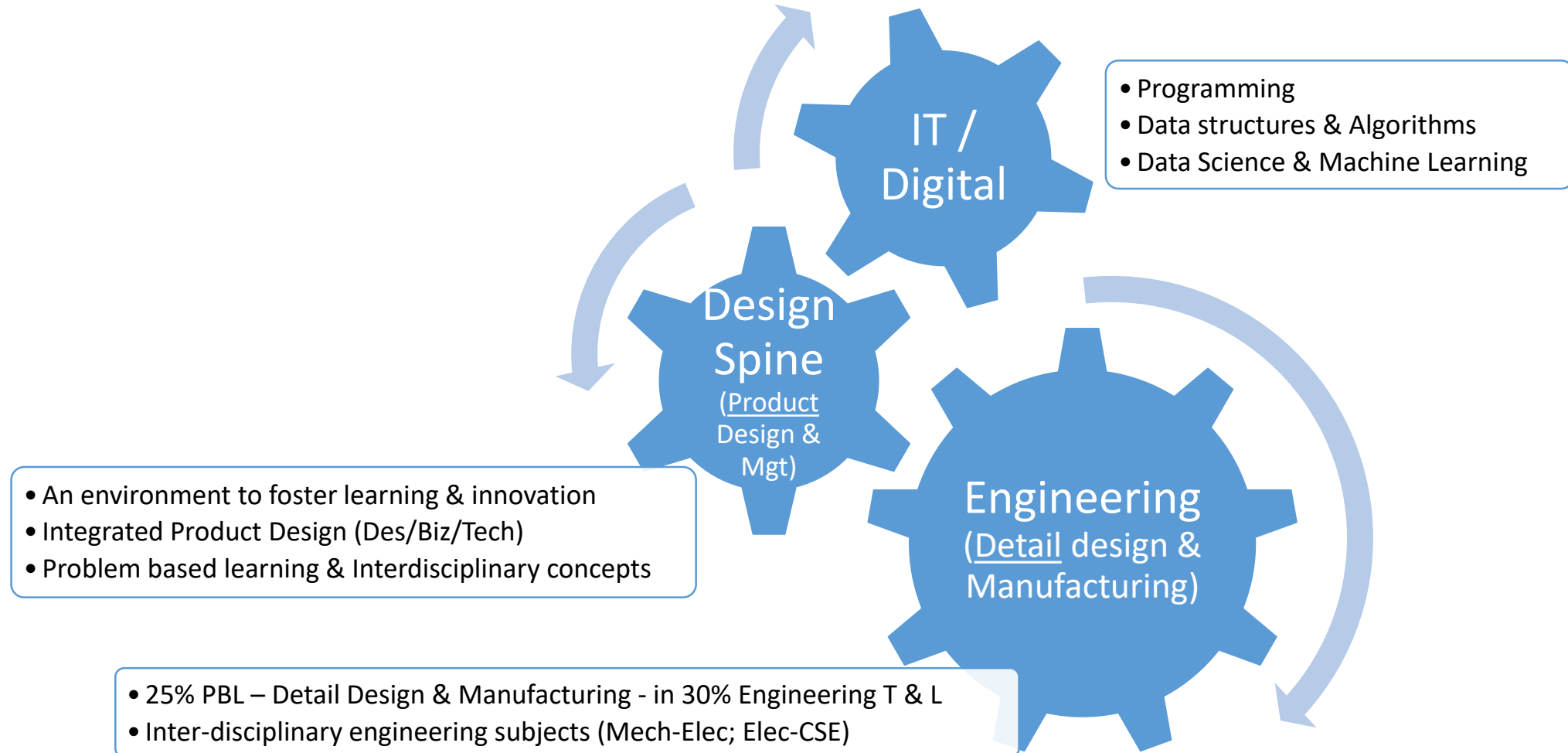
IIITDM's campus and programs draw inspiration from the local context: proximity to the manufacturing and IT corridors of Chennai and the UNESCO world heritage sites of Mahabalipuram and Kanchipuram

IIITDM produces three types of professionals to address the needs of the industry and student aspirations

1. Design-centric engineer
2. Design-Centric Engineer++
(Minor/Honors in Product Design)
3. Product designer*



Each program provides a unique blend of digital, design and engineering



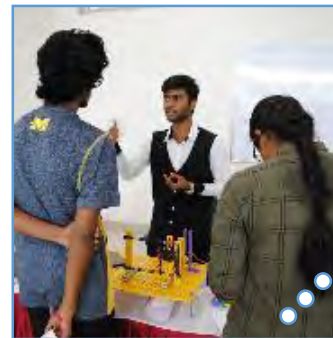
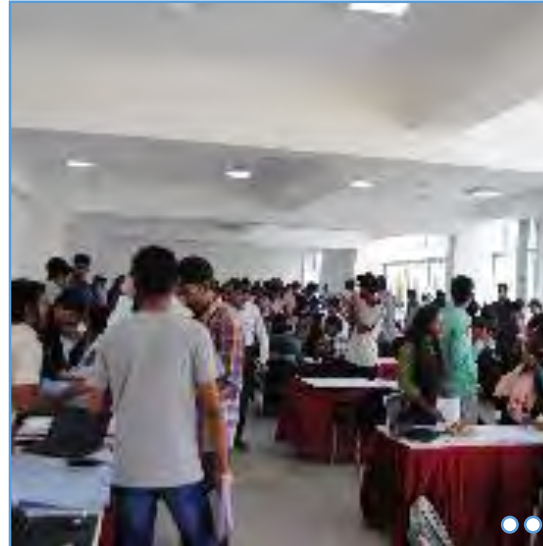
The carefully curated design spine helps promote interdisciplinary design and product innovation among engineering students

	Concept design		Embodiment design		Design-Entrep	Verticalized	Project
Semester	Society->Product	Product->Tech	Tech->Product	Product->Society	Product->Economy		
Level-1	1	Foundation					
	2	Sociology of design		SoD			PBL
	3	Sys thinking for design					PBL
	4		Smart product design				PBL
	5	E&M			Entrep & Mgt		PBL
Level-2*	6.1		Prototyping/Test				PBL
	6.2		ELE-1				
	6.3					ELE-2	
	7.1			ELE-3			
	7.2				ELE-4		
	7.3						Internship /Incub
	8.1				ELE-5		
	8.2					ELE-6	
	8.3						Final Project
Total credits	3+2*2+1=8	1+2=3	1+2*3+2=9	1+1+3=5	2+3=5	2*3=6	10+10=20

*Level-2 courses will essentially be taken from the portfolio of courses offered in the M.Des program in ODD/Even semester

* This will be applicable for both Design++ and M.Des Dual Degree students

EHIPASSIKO: The bi-annual industry open house event provides opportunity for students to pitch their concepts to industry experts



5 Industry Verticals

40+ Companies

600 Students / 160 Teams

75 Business Plans & Product Concepts

85 Smart Product Concepts

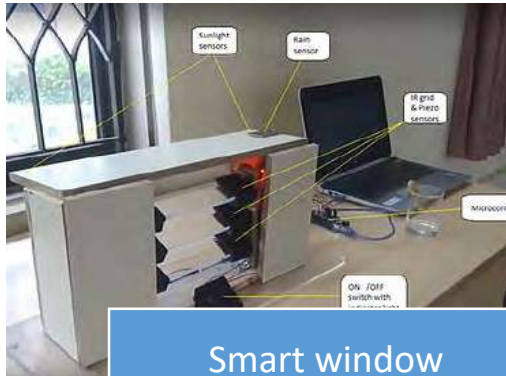
**78 Promising Product Concepts
recommended for further work**

2 patentable ideas

4 sponsorship interest

Students showcasing their concepts/prototypes in 9th edition of EHIPASSIKO Industry open house, Nov 2019

Examples of inter-disciplinary product innovations developed by students



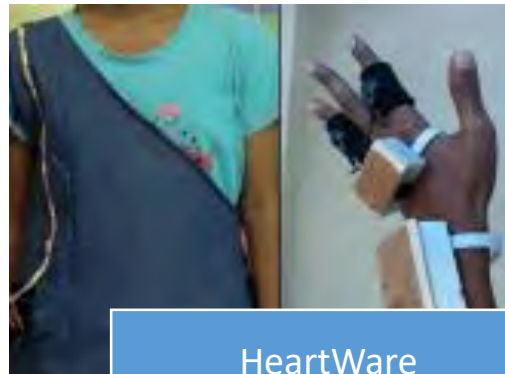
Smart window



Cool patch



Milk fat & adulteration detector

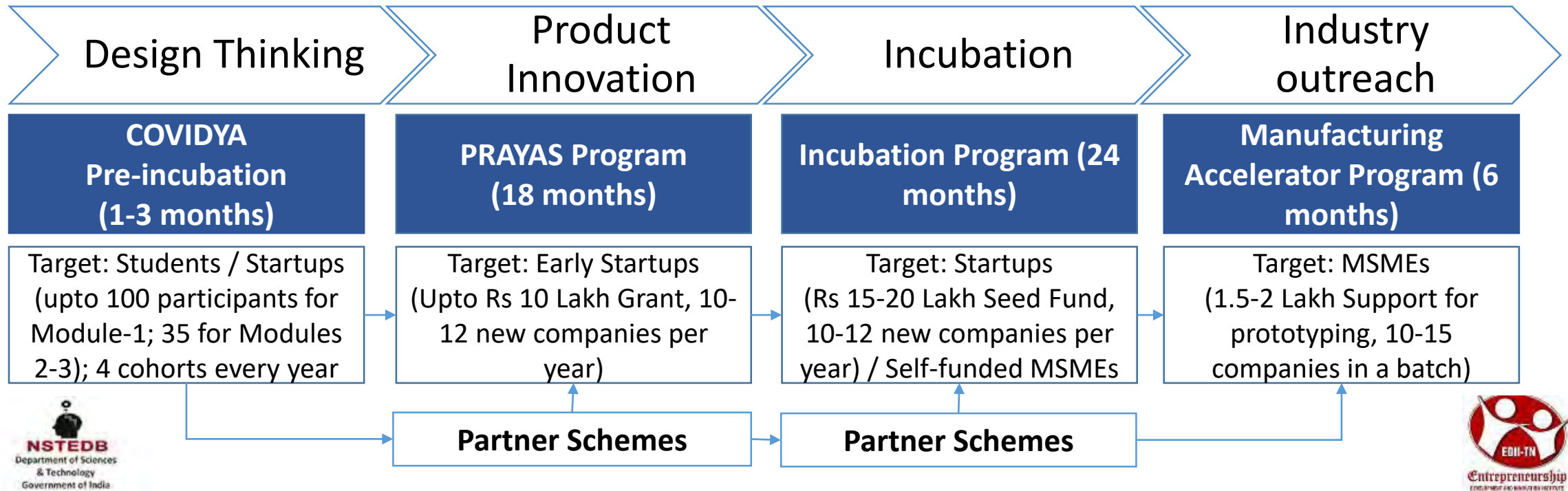


HeartWare

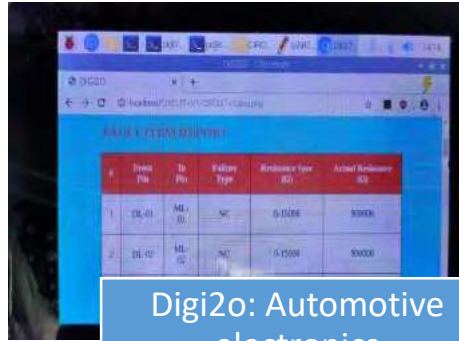


ProLeg

MaDeIT Innovation Foundation: Offers a four-year roadmap for student led innovation



Examples of startups and products incubated by MaDeIT



Digi2o: Automotive electronics



Sigaram Technologies: Smart Speedo



Arhunika: Smart lubrication system



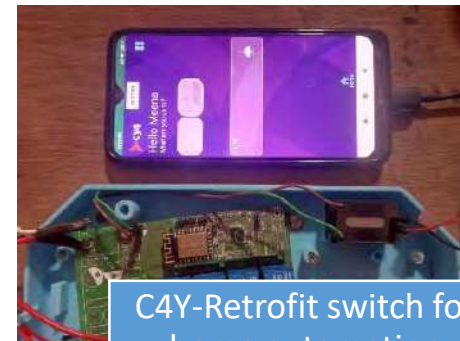
SSD Controls: Smart stabilizer



Efficienza: Solar panel cleaning



Way2Grow: Hydroponics



C4Y-Retrofit switch for home automation



Scermlind: Wearable for Athlete performance



The design-centric approach and incubation ecosystem have helped **IITDM** position itself in **Band-A (11-25)** among central institutions in the Atal Ranking of Institutions on Innovation Achievements - **ARIIA 2020**