



Gujarat Technological University

&

**Indian Institute of Science,
Bangalore**



Organizing:

One-Day Symposium on-

Role of Design in

“Make in India” & “Start-up India”

Date: 9th April, 2016

Time: 09:00 am onwards

Venue: GTU Auditorium, Chandkheda, Ahmedabad

Registration is mandatory and free on first-come-first-serve basis.

Please register through the online link: <http://goo.gl/forms/3hBJvAPbC9>

For more details, you may contact:

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Contextual Note:

Today, India stands at the threshold of dynamic economic growth. India is the seventh largest economy in the world with a steady growth in its GDP. India has a rich social, cultural and environmental diversity. But it missed the industrial revolution and its growth rates from 1947 to 1990 were insufficient to satisfy its needs. By opening up the controls on economic activity, the growth rate picked up after the nineties. Every one agrees that if growth is to be sustainable, it requires innovation in all areas of the innovation ecosystem: innovation in products, production systems, service systems, businesses and policy. During the last year, Government of India has designed programs such as “Make in India” and “Start Up India”, which can become platforms for supporting innovations.

But to realize an economically-independent, environmentally-sustainable and socially-responsible future requires the support of technically-sound, scientifically-rigorous and contextually-relevant solutions. This is where the role of *design thinking* becomes pivotal. Design as ‘planning for change’ is the engine for innovation in all forms. It cuts across all facets of the innovation ecosystem and connects them together. It is a knowledge-intensive activity that spans both problem-finding-and-formulation and problem solving to ensure development of feasible solutions that contextually fulfil functionality and improve the quality of life.

The Symposium will bring the academia, industry and policy makers to a common platform for delineating the role of design to support policies such as ‘Make in India’ and ‘Start Up India’, and to create networks that can actualize the potential. The GTU-IISc Symposium on the “Role of Design in Make in India and Start-Up India” is aimed at creating an environment for dialogue and collaboration among the academia, industry and policy makers so that design culture can be inculcated across the innovation ecosystem within the nation.

The Symposium is intended to bring together India’s leaders in design thinking from engineering colleges, Design Schools, IITs, IISc, industries and from policy-making institutions to deliberate upon the role of design in these initiatives and upon the kind of platforms and networks needed to actualize its full potential in energizing India’s innovation ecosystem.

<p style="text-align: center;"><i>Areas of Discussion for the Workshop</i></p>	<p style="text-align: center;"><i>Key Impacts sought from the Workshop</i></p>
<ul style="list-style-type: none"> ▪ Role of Innovation - ‘Make in India’ and ‘Start Up India’ - as driver for sustainable- inclusive growth 	<ul style="list-style-type: none"> ▪ Discuss key contributions of each towards sustainable inclusive growth ▪ Identify shortcomings and areas that require support
<ul style="list-style-type: none"> ▪ Role of Design as an engine for Innovation - product innovation, manufacturing systems innovation, service system innovation, business innovation & policy innovation 	<ul style="list-style-type: none"> ▪ Discuss how design can contribute to each of these Innovation areas ▪ Identify collaboration opportunities ▪ Develop support platform, networks and guiding documents
<ul style="list-style-type: none"> ▪ Role of Government, Industry and Academia in actualizing Design and empower Innovation 	<ul style="list-style-type: none"> ▪ Develop action plan to instill Design-driven Culture for innovation in Academia, Industry and Governance

Program

9th April (Saturday), 2016

0830-0900 Registration & Breakfast

0900-0940 Inauguration

0940-1110 Policy Session with Officials from Government and universities (20 min presentations from 3 policy people, 30 min panel discussion)

1110-1130 Tea/Coffee break

1130-1300 Industry session with Industry Experts (15 min presentations from 4 industry people, 30 min panel discussion)

1300-1400 Lunch

1400-1600 Academic Session with Eminent Design Academicians (15 min presentations from 6 academic people, 30 min panel discussion)

1600-1620 Tea/Coffee break

1620-1730 Presentations from GTU and IISc

1620-1655 GTU Design Spine presentation by GTU Faculty Members

1655-1730 IISc presentation on InDeate Tool and case studies by IISc students

1730-1800 Valedictory Session: Summary, Parting notes and Vote of Thanks

Note: At each session, we plan to have an eminent Design Expert to chair the session. We are approaching various persons for chairing the sessions and for participation as Panel Members. After we get the confirmation, we shall be adding the names on our web-site.

DESIGN THINKING at Gujarat Technological University (GTU): GTU has introduced a three credit Design Engineering subject based on globally accepted Design Thinking Methodology in every semester during the 2nd and the 3rd year of undergraduate engineering programs across all the streams of engineering in 120 Colleges across the State. The program, which was introduced in academic year 2014-15 in the 3rd Semester, is being taught to more than 90,000 engineering students in both the 4th and the 6th semesters during 2015-16. This intervention at GTU is unique in terms of its scale and depth.

The syllabi of Design Engineering programs, at GTU, have been crafted with expert inputs from academicians, practitioners and volunteers in the field of design. This two day conference will help evolve the courses through critical inputs from academicians, practitioners and researchers.

Recently many large Indian industries and organizations working in the areas of manufacturing, ICT, Logistics and Public systems have strongly advocated that design thinking and allied tools add value to the kind of HR that they need to run 21st century enterprises, which face global competition and which need continuous innovation. GTU while developing its academic program has taken into account these needs and has blended the design spine in the program in such a manner that it becomes a win-win situation for both academia and industry.

GTU started its journey of introducing Design Thinking into its syllabi at a joint meeting of the Expert Committees of all the Branches of Engineering on 2nd February 2012, when the task of designing the new syllabi was initiated. GTU had invited some external experts to address the meeting. Prof P.V.M. Rao of IITD delivered a talk through skype. GTU set up the Post-graduate Centre for Industrial Design – OPEN DESIGN SCHOOL and created the first document, defining its role.

GTU's Syllabus Committees started introducing Design Thinking into all its syllabi. Professor N J Rao (Retd) of IISc and Professor C Amarnath (Retd) of IITB during their visit, provided highly useful advice to GTU.

GTU organized a 4-day Workshop for Faculty Members on "Creativity & Design and Design Driven Innovation" on 27th – 28th April 2013 and 4th – 5th May 2013. The workshop was led by Mr. Rohit Swarup of International Innovation & Research Foundation (IIRF) and Prof. Amar Gargesh. The objective was to introduce design thinking and other creative approaches for innovation to the Faculty Members (<http://www.gtu.ac.in/circulars/13Jul/3072013.pdf>).

The new syllabi were implemented from August 2013. A document on the work of Open design School was published at <http://files.gtu.ac.in/circulars/14SEP/25092014Centre%20for%20Industrial%20Design.pdf>.

GTU organized a Design Session as a part of 2-day Seminar on Universities of the 21st Century on 8-9 January 2014. Experts in Design Engineering from all over the country were invited to present their views on how Universities could permeate design thinking into

the whole of the engineering syllabi. Prof C. Amarnath–IIT Bombay, Prof. Amaresh Chakrabarti –IISc, Bangalore and Prof. Manohar Swami accepted our invitation.

Prof C Amarnath gave sample problems on 9th February, 2014. On 9th August 2014, GTU organized a workshop on “Changing Characteristic of Engineering Education” by Prof P.V.M. Rao of IIT, Delhi, (The report is available at <http://files.gtu.ac.in/circulars/14SEP/25092014Workshop%20on%20bridge%20by%20pvm%20rao%20august%202014.pdf>)

On 22nd November, as a part of the 2-day National Workshop on Innovation and Entrepreneurship of 21-22 November 2014, a session on the syllabus for the spine of Design Engineering courses was organized with Dr. N. M. Bhatt, Dean for Post-graduate Studies at GTU and Chairman of the Syllabus Committee for Degree Engineering program and Professor Bhaskar Bhatt from IITGN as the Resource persons.

The first course, which was a part of the spine of of Design Engineering course, was offered during the academic year 2014-15 starting in August 2014. Mr. Yash Saxena of OpenFuel conducted Workshops for Faculty Members on ideas of empathy, ideation, product development and Business Model. (http://files.gtu.ac.in/circulars/14SEP/25092014_01.pdf).

Thereafter, till date GTU has organized 36 Faculty Development Programs (FDP) in which more than 2200 Faculty Members have participated. Each FDP is of 4 days. It attempts to introduce Design Thinking and it provides initial references to the Stanford MOOC course and a few other resources so that the Faculty Member can develop himself/ herself. As Dr. Vishal Sikka says, “No matter how immersive the course is, you can’t turn a person into a designer in one day, but the switch can get turned on that you can think and you can see there is a better way and bring learning to what you are doing.” He says it’s about making a grand transformation, and he understands that won’t happen overnight. It takes a very long time with huge rewards and equivalent risks. (<http://techcrunch.com/2015/05/16/infosys-ceo-on-mission-to-transform-his-company-into-design-thinkers/> dated May 16, 2015)

These FDPs have been organized by GTU’s Open Design School. Professors Karmjitsinh Bihola, and Jaimin Dave have conducted the FDPs with valuable help from Yash Saxena of OpenFuel, Prof Bhasker Bhatt of SCET Surat, Rohit Radhakrishnan of GIT, Gandhinagar, Mr. Rohit Swarup of , Mr. Amar Gargesh, Devina Kothari of Rajkot and Gagandeep Khanduja.

On 4-5 January 2016, the Centre for Industrial Design has organized an International conference on **“Infusing Design Thinking in Engineers’ Mind-sets across Industries & Building a Spine of Design Engineering Courses in Academia”**. This conference had the following sessions: (i) Panel Discussion on the Need of Design Thinkers in industries (ii) Panel Discussion on the Strategies, Best practices and next practices to build Design Spine in academia (iii) Presentation on learning from the Design experiments at GTU in pedagogy, process & its inferences (iv) Panel discussion on - How GTU should further develop its Design Spine interventions? Dr. Amaresh Chakrabarti, Professor and Chairperson, Centre for Product Design and Manufacturing, Convenor, at Indian Institute of Science, Bangalore, Dr. P. V. Madhusudhan Rao, Professor, Mechanical Engineering

Department, IIT Delhi, Dr. Devdas Shetty, Dean School of Engineering and Applied Sciences, University of the District of Columbia, Washington DC, USA, Dr. R Gnanamoorthy, Director of IIITDM, Chennai, Prof. Dinesh Korjan, PEDID-PD, NID, Ahmedabad, Prof. Bhavin Kothari, National Institute of Design, Gandhinagar, Mr. G. Sunderraman, Executive Vice President – Corporate Development, Godrej & Boyce Mfg Co Ltd, Mr. Prakash Vani, Platypus Designs Pvt. Ltd, Mr. Rohit Swarup, Chairman, Innovation & Research Foundation were some of the eminent participants.

Innovation, Student Start-ups and Solutions of Social Problems at GTU: GTU has been developing its programs for Student Start-up Support Systems and IPR for the last five years and its policies are being followed by nearly all the technological universities in India. (The *GTU Student Start-up Policy* and the associated *Skilling India Mission Policy at GTU* are available at http://files.gtu.ac.in/circulars/14DEC/05122014_02.pdf and at <http://files.gtu.ac.in/circulars/14DEC/22122014.pdf>.) GTU's Post-graduate Research Center in Industrial Design and Open Design School jointly with the District Panchayats of Ahmedabad and Sabarkantha has been working on the issues faced by health, child welfare and education. On Oct 27-28, 2015, about 100 students, at a Hackathon –with the help of government officers and GTU professors, developed preliminary solutions for ten of the social problems. GTU's S4 and Technology Business Incubator is prepared to help the students develop products from these solutions. (Please see http://files.gtu.ac.in/circulars/15Nov/10112015_3.pdf.) Another group of students have worked on social problems on March 10-11, 2016, as a part of GTU's TechFest. These solutions are being evaluated.

Design Thinking at IISc, Bangalore:

Centre for Product Design and Manufacturing (CPDM) is the most research and technology intensive design school in India, situated within the strong research ambiance of Indian Institute of Science (IISc), Bangalore. IISc is the only institution in India among the top 100 institutions in the world (THE ranking), and CPDM is the design and manufacturing face of IISc. CPDM is among very few design schools in the country that train students in developing and making systemically-complex, technologically-intensive, and socially-impactful solutions that are functional, aesthetic, usable and sustainable. It is among the top design schools in the world in development of hardware products, and is among the very best in research into design, ranking alongside design schools and research centres in Stanford, Delft, Cambridge and CMU.

The Masters in Design (MDes) programme at CPDM is a challenging mix of training into user-research, creativity, hard-nosed engineering, and design for X, with an eventual product that must juggle and blend the soft and the hard, that would solve the problem and wow the user. The programme takes graduate engineers and architects as input through a most challenging design aptitude test and handpicks the best 25 for grooming and training

through its knowledge, skill and reflection based curriculum that turns these chosen few to lead existing practice and create new practices in design. About a third of its final year projects are patentable as technology patents, and about 20% of the ex-students remain in campus to incubate their products into start-ups. Ex-students of CPDM have led design in practice with distinction, with examples such as Saurav Singh and Rajesh Gogu who designed the first indigenous car from Suzuki – A-Star, or Arun Kumar Francis who designed the award-winning TVS Apache and Akula. Ex-students from CPDM have gone on to win various major international design prizes, and several started their own companies. A striking example of the latter is Nitin Gupta who started the Agro-product company Sickle Innovations who was picked up by India's Prime Minister Shri Narendra Modi among his 30 most promising young entrepreneurs.

The research programme at CPDM, which includes both MTech by Research and PhD, is the first formal research programme in the country into design, boasting laboratories at the bleeding edge of research cutting across ideation, PLM, medical diagnostics, human factors, digital manufacturing and engineering safety. CPDM initiated India's first design observatory at its Innovation, Design Study and Sustainability Laboratory (IdeasLab) in 2002, and India's first Smart Factory in 2015 in collaboration with The Boeing Company USA. Boeing is a strategic partner of IISc, alongside University Cambridge in the UK and Tshinghua University in China. CPDM hosts one of the first five Design Innovation Centres (DIC) funded by the MHRD, GOI to support innovators and mentor their mentors via a programme that straddles incubation, training and online courseware. CPDM also initiated India's first Center of Excellence on Design of Sustainable Systems in collaboration with University of California Berkeley, Syracuse University, Washington State University, Center for Science, Technology and Policy Bangalore, IIM Ahmedabad and National Innovation Foundation.

A major thrust of research from CPDM is developing knowledge-intensive and testable tools for supporting complex product development. Outcomes include the world's most advanced Digital Human Models (DHM), A Biomimetic Tool called Idea-Inspire that pioneered systematic biologically inspired ideation, and lightweight 3D compression systems for transferring complex geometric models across the internet. The programme has about fifty research students, the work of whom is already making the job of the product developer sometimes possible for the first time, often far simpler, sometimes more efficient, and almost always highly cost-effective.

For fostering international quality research into design within India, CPDM initiated two major conferences, which have now become benchmark followed by many around the globe. The first is ICoRD – the International Conference series on Research into Design. ICoRD started with only 30 papers and about as many people in 2006, but grew rapidly to about ten times its size in 11 years to become the benchmark international conference within the country that provides international quality at affordable price. CPDM also initiated the world's first Product Lifecycle Management (PLM) conference, which has now gone global.