

## **A Comprehensive Learning Report on:**

***An International Conference on Design Thinking with the Theme of***

# **Infusing Design Thinking in Engineers' Mindsets across Industries and Building a Spine of Design Engineering Courses in Academia**

**Organized By:**



**Gujarat  
Technological  
University**

**Endorsed By:**



**India  
Design  
Council**

**Host: Centre for Industrial Design (Open Design School)**

**Date: 4<sup>th</sup> & 5<sup>th</sup> January, 2016**

**Venue:**

**Gujarat Technological University**

Nr.Vishwakarma Government Engineering College

Nr.Visat Three Roads, Visat - Gandhinagar Highway Chandkheda,

Ahmedabad - 382424 - Gujarat

# Post-graduate Research Centre for Industrial Design

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### Conference Itinerary - Day 1: 04/01/2016

09:00 am to 10:30 am	- Registration & Tea, Snacks
10:30 am to 11:15 am	- <b>Inauguration Ceremony</b>
	<ul style="list-style-type: none"><li>▪ Welcome Note by <i>Mr. J. C Lilani</i>, Registrar - GTU</li><li>▪ Introduction of Design Spine &amp; Conference by <i>Dr. N M Bhatt</i>, Dean, ME &amp; PhD, GTU; Director, Gandhinagar Institute of Technology</li><li>▪ Inaugural Talk by <i>Prof. Anil K. Gupta</i>, Professor, IIM – A; Founder, Honey Bee Network Executive Vice Chair, National Innovation Foundation; Coordinator, SRISTI</li><li>▪ Inaugural Talk by <i>Prof. Pradyumna Vyas</i>, Member Secretary, India Design Council; Director, NID</li><li>▪ Mr. Nigel Wright, Pro-VC, DMU, UK</li><li>▪ Inaugural Talk by <i>Dr. Akshai Aggarwal</i>, Hon'ble VC – GTU</li><li>▪ Vote of Thanks - <i>Prof. Karmjitsinh Bihola</i>, Assistant Professor, Centre for Industrial Design - GTU</li></ul>
11:15 am to 12:00 pm	- <b>Session 1: Keynote Address 1</b>
	<ul style="list-style-type: none"><li>▪ <i>Prof. Amaresh Chakrabarti</i>, Head, CPDM, IISc, Bangalore</li></ul>
12:00 pm to 12:15 pm	- Networking Tea Break
12:15 pm to 01:15 pm	- <b>Session 2: Expert Talk &amp; Panel Discussion on need of Design Thinking Skilled Workforce in industries and strategies to Leverage them</b>
	Panellists:
	<ul style="list-style-type: none"><li>▪ Chair: <i>Mr. G Sunderraman</i>, Vice President, Corporate Development, Godrej &amp; Boyce, Mumbai</li><li>▪ <i>Mr. Prakash Vani</i>, Founder of Platypus Designs Pvt. Ltd., A'bad</li><li>▪ <i>Prof. Amaresh Chakrabarti</i>, Head, CPDM, IISc, Bangalore</li><li>▪ <i>Prof. Rohit Swarup</i>, Founder Director, Xplora Design Skool</li><li>▪ <i>Mr. Shreeyash Kolhapure</i>, Manager –Global Services, Tata Technologies, Pune</li><li>▪ <i>Mr. Sunil Shah</i>, Chairman, Gujarat Innovation Council</li></ul>
	Questions & Answers
01:30 pm to 02:30 pm	- Lunch Break
02:30 pm to 05:00 pm	- <b>Session 3: Expert Talk &amp; Panel Discussion on Strategies, Best Practices and next practices to build design spine in academia</b>
	Panellists:
	<ul style="list-style-type: none"><li>▪ <i>Prof. P V M Rao</i> (Chairperson), Prof, Mech Engg. Dept, IIT-D</li><li>▪ <i>Dr. Devdas Shetty</i>, Dean, School of Engineering and Applied Sciences, Prof. of Mech. Engg., University of the DC, Washington DC, USA</li><li>▪ <i>Dr. N M Bhatt</i>, Dean, ME &amp; PhD, GTU; Director, Gandhinagar Institute of Technology</li><li>▪ <i>Dr. Gnanamoorthy</i>, Director &amp; Professor of Mechanical Engineering, IIITD&amp;M, Kancheepuram, Chennai</li><li>▪ <i>Prof. Dinesh Korjan</i>, Prof in Design, IIT-GN, Founder, Korjan Studio</li><li>▪ <i>Prof. Bhavin Kothari</i>, Associate Senior Faculty - Strategic Design Management, NID</li></ul>
	Questions & Answers

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**Day 2: 05/01/2016**

09:30 am to 10:30 am	- Tea & Snacks
10:30 am to 11:30 am	- <b>Session 1:</b> Keynote Address 2 <ul style="list-style-type: none"><li>▪ <i>Dr. Devdas Shetty</i>, Dean, School of Engineering and Applied Sciences, Prof. of Mech. Engg., University of the DC, Washington DC, USA</li></ul>
11:30 am to 11:45 am	- Tea break
11:45 am to 12:00 pm	- <b>Case Study:</b> <i>Mr. Rohit Swarup &amp; Mr. Ninad Shastri</i>
12:00 pm to 01:00 pm	- <b>Session 2:</b> Presentation on learning from Design Experiments in GTU in pedagogy, process and its inferences. (3 presenter / faculty with 10-12 minutes each)
<b>1<sup>st</sup> Presenter - Prof. Sudeep Sunil Kolhar &amp; Prof. Milan Jitendra Pandya</b>	
<b>2<sup>nd</sup> Presenter - Prof. Bhasker Vijaykumar Bhatt</b>	
<b>3<sup>rd</sup> Presenter - Prof. Parth N Raval</b>	
Comments by Jury Members: <ul style="list-style-type: none"><li>▪ <i>Dr. Devdas Shetty</i></li><li>▪ <i>Dr. Gnanamoorthy</i></li><li>▪ <i>Mr. Rohit Swarup</i></li><li>▪ <i>Mr. Ninad Shastri</i></li></ul>	
01:00 pm to 02:00 pm	- Lunch Break
02:00 pm to 02:15 pm	- <b>Case Study:</b> <i>Prof. Geetha Prakash</i> , Dean, EC Dept., Nagarjuna College of Engineering & Technology, Bangalore
02:15 pm to 03:00 pm	- <b>Session 3:</b> Presentation on learning from Design Experiments in GTU in pedagogy, process and its inferences. (3 presenter / faculty with 10-12 minutes each)
<b>4<sup>th</sup> Presenter - Prof. Amit Rathod</b>	
<b>5<sup>th</sup> Presenter - Prof. Gagandip Singh Khanduja, Prof. Karmjitsinh Bihola &amp; Prof. Jaimin Dave</b>	
<b>6<sup>th</sup> Presenter - Prof. Bhargav Patel &amp; Prof. Ajaysinh Vaghela</b>	
Comments by Jury Members: <ul style="list-style-type: none"><li>▪ <i>Prof. Amaresh Chakrabarti</i></li><li>▪ <i>Prof. Geetha Prakash</i></li><li>▪ <i>Prof. Dinesh Korjan</i></li><li>▪ <i>Prof. Amar Gargesh</i></li></ul>	
03:00 pm to 04:15 pm	- <b>Session 4:</b> Panel discussion on Way forward: How GTU should develop its Design Spine interventions in next semesters? <ul style="list-style-type: none"><li>▪ <i>Dr. Akshai Aggarwal</i>, Hon'ble VC – GTU, Ahmedabad</li><li>▪ <i>Dr. N M Bhatt</i>, Dean, ME &amp; PhD, GTU; Director, Gandhinagar Institute of Technology</li><li>▪ <i>Dr. Gnanamoorthy</i>, Director &amp; Professor of Mechanical Engineering, IIITD&amp;M, Kancheepuram, Chennai</li><li>▪ <i>Dr. Devdas Shetty</i>, Dean, School of Engineering and Applied Sciences, Prof. of Mech. Engg., University of the DC, Washington DC, USA</li><li>▪ <i>Prof. Amaresh Chakrabarti</i>, Head, CPDM, IISc, Bangalore</li><li>▪ <i>Prof. Dinesh Korjan</i>, Prof in Design, IIT-GN, Founder, Korjan Studio</li></ul>
04:15 pm to 04:30 pm	- Tea break
04:30 pm to 05:00 pm	- Concluding & Valedictory speech



“**Make in India**” and “**Start-up India, Stand-up India**” are designed to rejuvenate the innovation and entrepreneurship culture and to create new jobs for the youthful nation. Some analysts say that India is a country of prototypes rather than products with innovation. Even though many persons, educated in India, have made a mark in the top-most technology companies of the world, our technical educational system is said to produce engineers, who are unable to design new products. Even after the success of Mangalyaan, after the amazing reputation, gained by India’s IT industry and after many

Indian companies have acquired a multi-national status, our technologists in engineering and pharmaceutical fields are said to be working at primary levels of technology and are said to lack world-class design capabilities.

To achieve these dreams, GTU has hosted the two day conference which brought academia, industry, public policy makers and design practitioners on the same platform. GTU has involved nearly 2,000 Engineering Faculty Members across its affiliated colleges to deliver the Design Engineering courses. One of the key objectives of this conference is to seek inputs from design experts of national and international repute about the spine of Design Engineering courses as well as our efforts at introducing design thinking into the entire degree engineering program at GTU. While we have planned an exclusive session for the Faculty Members who are responsible for the design engineering courses in the country, we have another session in which industry experts had participated in discussions to share their needs.

At the end of this two day program, a panel discussion was held to develop strategies and a set of recommendations for building Design Spine into the engineering degree programs at State Technological Universities. GTU Innovation Council (GIC) has pioneered in setting up innovation culture on a large scale. GIC has developed **Student Start-up Support System (S4), a Co-Working Space and an Incubator** to support the spin off ideas. We are confident that through this conference, the idea of Design Thinking will gain a greater traction and the ‘Design Spine’, at GTU, will become even more effective.

### ***Summary of Conference***

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**Day 1: 4<sup>th</sup> January, 2016**

### *The grand opening of conference with Inaugural Ceremony:*

When any function is commenced by lighting of a lamp, with the help of Atmajyoti, the respective Deity Principle is invoked from the Universe and a prayer is offered for the waves of the Deity to be present at the venue. To activate God's *Sankalp-shakti* for accomplishing desired task, the conference was started with lamp lightning by all chief guests along with Dr. Akshai Aggarwal, Hon'ble Vice Chancellor - GTU. Ms. Tosha Shukla warmly welcomed all dignitaries, invited experts, delegates and participants with New Year wish as this was the very first event in GTU in the beginning of year 2016. Dignitaries on dais were greeted then with flower bouquet by Mrs. Shakuntla Aggarwal as token of cherished memories.

**Shri. J.C Lilani, I/C Registrar – GTU** ceremoniously welcomed all, in his welcome speech, where he mentioned unparalleled activities and initiations at GTU in the field of Innovation and Entrepreneurship. He added that GTU is the first state university which has prepared the Startup Policy for its students. He added that under the visionary guidance of Dr. Aggarwal - Hon'ble Vice Chancellor, Design Thinking was introduced in the syllabi of GTU in all discipline from 3<sup>rd</sup> semester along with other initiation like GTU Innovation council, Student Startup Support System (S4), IPR, Community Innovation & Co-Creation Center (CiC3) was established.

**Dr. N.M Bhatt (Dean, ME & PhD – GTU; Director, Gandhinagar Institute of Technology)** revealed the GTU's splendid efforts to implement the Design Engineering as curriculum in the syllabi of Bachelor Degree program. He gave brief idea about the Design Spine of GTU which is based on globally accepted and practiced Design Thinking Methodology by designers and engineers. Design Spine at GTU comprises the six phases namely Observation, Empathy, Ideation, Product Development, Prototype and Testing from 3<sup>rd</sup> to 6<sup>th</sup> semester, and in final year students need to apply this learning of Design Thinking into their IDP/UDP projects for getting innovative solutions. He added that at GTU to keep all students (which are nearly 40,000 in one semester from all affiliating colleges) on same platform, we have developed frameworks and canvases with help of Mr. Yash Saxena, Founder of Openfuel. Lastly, he pointed out the objective of conference by saying that GTU is seeking key inputs and suggestions from all experts and participants who are the real stakeholder in this process to improve Design Engineering.

**Prof. Anil Gupta (Professor, IIM-A; Founder - Honey Bee Network; Executive Vice Chair – National Innovation Foundation; Coordinator - SRISTI)** gave the inaugural talk in the conference. In his talk, he amazingly explained the importance of Observation for the Design

Thinker in the innovation process by giving some of the examples. He talked about the Jain Temples on Shatrunjaya hills in the city of Palitana, Bhavnagar districts, Gujarat, India to explain how people in ancient time were also used Design Thinking. The steps of the temples as well on hills were designed in such way that anyone can climb it irrespective of age group. In second example, he narrated the story of one girl from Patna, Bihar who was studying in 8<sup>th</sup> class, observed that her grandfather had difficulty in climbing the stairs with the use of walker available in the market. She observed that walker can't be used on stairs due to the fixed legs. So she just did little modification in walker and made the legs adjustable to height of stairs due to which her grandpa was able to use that on stairs too. He gave one more example in order to make more clarity about how problem can be identified by paying attention while observing the things around us. He said there was one girl from a small village in Gandhinagar district who had presented, her idea of modification in water tap which are connected in series at different height, in one idea competition. She observed that in her school the water tapes were at little higher level so primary students (comparatively have less height) were not able to use that water tap. So she thought why it can't be an inclined so each student can use it having different heights. In this way, Prof. Anil Gupta explained how creativity can born from Samvedna (sensitivity). He added that to convert Samvedna into creativity you should be a part of that community, so co-creation and empathy is required to understand the hidden needs of user. Then he emphasized on a good conversation which now a days very less among the people by saying that a good design is the one which triggered a conversation, doesn't matter whether it is critics or appreciation for design, but at least there should be talk about design. Lastly, he gave some synonymous words for design from "Sanskrit" like "SAMVEDNA – Sensitivity", "SANVAD - Conversation", "SARALTA - Simplicity" and "SANTOSH - Satisfaction".

**Prof. Pradyumna Vyas (Member Secretary - India Design Council; Director - NID)** said that we should update from *Traditional Design to Design Thinking with System Thinking approach*. He emphasized on two words while his talk - Manipulation and Exploration. He said that if you have designed or modified something for solving a problem, don't keep it to yourself only, but explore it to the world for benefit to others. In order to develop a good and sustainable design, one should consider emotional aspects of people as well consider inputs from all stakeholder even their roles are not significant and then use the technology to develop it. For example, if you are designing an ATM machine then you should consider all people who will use it, bank staffs, security guard, police and even thief as stakeholder. According to him there are 2 types of innovation; (1) Break-Through Innovation and (2) Incremental Innovation. In Break-Through Innovation, there would be a completely new design or development that was not exist before. While Incremental Innovation is one in which some modifications would be made to increase

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the efficiency and performance. He concluded, If India wants to be a global leader like Germany, USA then we must engross System Thinking into our learning.

**Mr. Nigel Wright (Pro-Vice Chancellor & Dean of Technology, De Mont fort University, UK)** also focuses on the people's perspective while designing something. For that, you will have to interact with people constantly. He said that there may not be single solution for one problem, so designer should focus on every aspects of it and try to find more alternatives to one problem and then converge for better one with iterations.

**Dr. Akshai Aggarwal (Honourable Vice Chancellor, GTU)** started his talk by giving definition of an Engineer and said an Engineer must be a problem solver. He further said that now a days, unfortunately, engineer is not even able to recognize the problem. This unique initiation of Design Engineering subject at GTU will help a student to develop an attitude of a problem solver. GTU has been continuously trying to produce good engineers by introducing open ended problems by Design Engineering and Project Based Learning system. He added that classroom should be a place where designer & students can interact and Laboratory should be a place for discovering something new continuously. He also talked about the Vishwakarma Yojna of GTU under which students have been visiting villages to survey the village, to re-imagine and re-design the infrastructure of the village and to prepare the Detailed Project Report for the infrastructure as a part of their Final Year project. He also mentioned the efforts of GTU Innovation Council (GIC), the Student Startup Support System (S4), the IPR Cell, the Community Innovation & Co-Creation Center (CiC3) where thousands of students and faculty members regularly worked after-hours and at week-ends and holidays in different areas of Innovation, IPR, Startup, Entrepreneurship and Technology through various workshops and programs.



Dignitaries during the Lamp Lighting Ceremony



Prof. Tosha Shukla, A.P., CiC3 - GTU, welcoming all

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Welcome Note by Mr. J. C. Lilani, Registrar - GTU



Dr. N. M. Bhatt, Dean, ME & PhD, GTU; Director, GIT giving Introduction of Design Spine



Prof. Anil K. Gupta, Professor, IIM – A sharing thoughts during Inaugural Talk



Prof. Pradyumna Vyas, Director, NID-Ahmedabad at Inaugural Talk



Mr. Nigel Wright, Pro-VC, DMU, UK at the Inaugural Session of Conference



Dr. Akshai Aggarwal, Hon'ble VC – GTU sharing importance of Design Thinking at Conference

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Prof. Karmjitsinh Bihola A.P.-GTU Open Design School during Vote of Thanks



A view of audience attending Inaugural session of the Design Thinking Conference



Dignitaries on dais during Inaugural function at the conference



### Session 1: Keynote Address

by – Prof. Amaresh Chakrabarti (Head, CPDM, IISc, Bangalore)

**Prof. Amresh** shared the initiatives and role of Design Department at IISc with other activities. He talked about Genesis Space Probe & its failure where he mentioned that the reason behind its failure is faulty design. He explained difference between domain knowledge & process knowledge. Prof. Amaresh and his team have developed a Design Tool named “InDeaTe” (InDeaTe – is short form of India + Ideate) that enables the user/stakeholder in today’s effervescent innovation ecosystem to face these challenges, by empowering ideation through a methodical process of design.



Prof. Rutika Ghariya, AP – CiC3, GTU, giving floral welcome to Prof. Amaresh Chakrabarti

#### The key points during the talk were:

- Design may look complex but at the same time it would be very important to solve the challenge; and one who really deeply connected with Design Thinking would take it as fun.
- Design Thinking is a tool for change of mindset and with this creative mindset one may attain the desired goals.
- Design Thinking will help to scout the problems or goals you want to solve and sustainable solution for the same.
- Design draws **Domain knowledge** from Society, Business, Technology and Ecology which develops or integrates technology using **Process knowledge** to provide value back to society to fulfill its needs. To support this, he gave nice example of how Nokia x6 come up with new slim speaker. Once senior design manager of Nokia was walking through Indian streets and he observed a boy trying to listen music on his mobile amidst loud noise. He thought why not to make louder mobile phones and thus Nokia ended up with new louder speaker phones.



Prof. Amaresh Chakrabarti sharing views during his keynote session

- One of the key area for Design Thinking is to study Material Sciences and again to support his views on importance of material science, he gave an example of CUED which was developed for people with muscular dystrophy, which was not affordable. He told that in this case domain knowledge of materials & manufacturing process was not appropriately combined.
- Design Thinker or Innovator persist some basic characteristics such as curiosity, self-motivation, perseverance, learning, questioning ability, and understanding of environment.

### Session: - 2

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#### **Expert Talk & Panel Discussion on need of Design Thinking Skilled Workforce in industries and strategies to Leverage them**

This panel was created to discuss the importance of Design Thinking mindset in Industries and how academia can provide skill set to Engineering student required by the Industry. During the Panel discussion following experts were present and shared their views regarding the topic.

1. Mr. G Sunderraman (Chairperson) Vice President, Corporate Development, Godrej & Boyce, Mumbai
2. Mr. Sunil Shah, Chairman, Gujarat Innovation Council, Ahmedabad
3. Mr. Shreeyash Kolhapure, Manager –Global Services, Tata Technologies, Pune
4. Prof. Amaresh Chakrabarti, Head, CPDM, IISc, Bangalore
5. Prof. Rohit Swarup, Founder Director, Xplora Design Skool
6. Mr. Yash Saxena, Founder Openfuel

**Mr. G Sunderraman** chaired the panel discussion. He initially showed one interesting video to make audience understand that how he learnt design thinking and informed that cooperation and motivation is necessary for learning and implementing Design Thinking.

**Mr. Sunil Shah** said that Innovation is everybody's job by sharing some motivational thoughts to audience. Also the audience had taken oath along with him to work on at least one innovation per year.

**Mr. Shreeyash Kolhapure** believed in Design Thinking as important learning tool to make the vision of honorable PM "Make in India" successful as innovation is essential requirement now a days. He guided the students to learn subjects with practical orientations. He added that there

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were 3 things which triggered innovation, (1) inconvenience, (2) Technology evolution, (3) cross functionality of disciplines.

**Mr. Rohit Swarup** enlightened on Design Thinking saying that it is like riding bicycle, you will have to involve in it then only you can understand & learn it. According to him, the things which are preventing us to get innovations are lack of awareness, lack of identifying opportunities and lack of system approach. We must focus on purpose and functions of the products to be designed where Design Thinking will play crucial role.

**Mr. Yash Saxena** shared his recent experience of facing problem in boarding pass, he said there is no specific indications for the details on boarding pass. He added that Indian companies are more interested in selling of their existing product rather they should try to bring some innovations & modifications in their product.

**Mr. G Sunderraman** concluded the session with remarks that Industry and academia must work in collaboration for the innovation and for that better Ecosystem is required with government support. To support his views he said in Germany, the contribution of MSME in GDP of country is more, while it is less in India.



Mr. G Sunderraman, Chair of Session, during discussion



Mr. Sunil Shah during panel discussion



Mr. Shreyash Kolhapure sharing thoughts at session

Prof. Amaresh Chakrabarti sharing thoughts at session



Prof. Rohit Swarup sharing thought during session



Mr. Yash Saxena sharing thought during session

### Session 3

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#### **Expert talk & Panel discussion on Strategies, Best Practices and Next Practices to Build Design Spine in Academia**

In this session, discussions were around the best learning methods and implementation on practical learning methodology to permeate the Design Thinking into Engineering Education in Indian pedagogy. During the Panel discussion following experts were present and shared their views regarding the theme.

1. Prof. P V M Rao (Chairperson), Mechanical Engineering Dept., IIT-Delhi
2. Dr. Devdas Shetty, Dean, School of Engineering and Applied Sciences, Prof. of Mechanical Engineering, University of the DC, Washington DC, USA
3. Dr. N M Bhatt, Dean, ME & PhD - GTU; Director, Gandhinagar Institute of Technology

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4. Dr. Gnanamoorthy, Director & Professor of Mechanical Engineering, IIIT-D&M, Kancheepuram, Chennai
5. Prof. Dinesh Korjan, Prof. in Design, IIT-GN; Founder, Korjan Studio
6. Prof. Bhavin Kothari, Associate Senior Faculty - Strategic Design Management, NID

**Prof. P.V.M Rao** chaired this panel discussion. He said that our academic structure is based on *Knowledge Creation* while industry seeks *Knowledge Application*, so he suggested the students to focus on practical orientation rather rote learning. He explained how ecosystem should be for teaching design thinking as subject by noting example of IIT-D. At IIT-D, students were given the newspaper and they need to identify the news that bothers them most and try to find ideas to solve those issues. He also added that in his view faculties are the weakest link as change of adoption is major problem. One has to develop habit to look at the problems as an opportunity. He also emphasized to give ownership to students as they are excited and also capable to doing everything, faculty only has to work as a facilitator. Work on principle of Push and Pull in systematic manner to achieve goals. Failures should be most welcomed in Design Engineering, one has to work on Build-Test-Fail-Modify.

**Dr. Devdas Shetty** said that design thinking is very close to his heart by emphasizing on “learning by doing”. He suggested the students to work on interdisciplinary projects as real world problems involve all disciplines into solving them rather having one. Our students must be prepared to bridging the various engineering frontiers. He gave amazing thought of entrepreneur in residence. He advised the faculty members to look into the better association of theory and practical modules while developing the curriculum. He focuses on the evaluation scheme to better judge the learning by students to achieve desired objectives of the course.

**Dr. N M Bhatt** informed all present, regarding the strategies of University to implement the Design Engineering and current scenario of the subject. He also added that there is resistance while implementation of the subject into the curriculum as change of mindset is always a big humanoid problem. He also cleared about some of the myth of Design Engineering subject like majority students and some of faculty members believe that canvas preparation is the only Design Engineering, but canvases are the only frameworks or tools to help the students and create the Design Thinking mindset. Design Engineering is a mindset or philosophy that can change the innovation culture in Gujarat and in the country. Design Engineering is not a separate subject but its philosophy must be infused in all subjects.

**Dr. Gnanamoorthy** initially showed the journey of IIITDMs since 2007 to 2015. At IIITDMs they have introduced interdisciplinary courses in which students will adopt experimental learning approach. The curriculum at IIITDMs is designed to promote product innovation & entrepreneurship.

**Prof. Dinesh Korjan** said that there is immediate need to redesign the engineering curriculum and added that design is something which can't be taught to mass, it is inherent. He also

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congratulated GTU to take first step towards implementing Design Thinking into Engineering Education. He believes that gives ownership to students and encourages them to learn from failures not to be afraid from the same.

**Prof. Bhavin Kothari** emphasized on why we should integrate Design Thinking in education & how? He talked about the current Design Thinking strategies, which previously only focuses at aesthetic area. He firmly believes that Design Thinking is nothing but Mindset. Prof. Kothari also added that to learn something new one has to be ready for unlearning. He added that we have to become opportunity creator rather than problem creator. He also talked about different essence of Design Thinking like Appreciate Ambiguity, Fuzzy Front End, Systems Approach and Deductive versus Abductive etc. He said that qualitative research is more important than quantitative research.

**Prof. P. V. M Rao** concluded the session by saying that it is not easy to implement Design Thinking to mass but GTU should try as it will bring huge change in innovation culture and creative mindset to students. Also he said failure shall be celebrated by students as well as faculty members and try to learn from it to further modify the system.



Prof. P V M Rao during the Panel discussion Session



Dr. Devdas Shetty sharing experience during discussion



Dr. N M Bhatt sharing experiences of Design Spine during panel discussion



Dr. Gnanamoorthy during the Panel Discussion Session

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Prof. Dinesh Korjan at the Session



Prof. Bhavin Kothari during his talk at session



Participants enthusiastically discussing various aspects to implement Design Thinking into pedagogy during the session





Experts satisfactory given the answers to all questions raised during the session

### Day 2: 5<sup>th</sup> January, 2016

#### **Session 1: Keynote Address**

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**by - Dr. Devdas Shetty ( Dean, School of Engineering & Applied Science,  
Prof. - Mechanical, University of DC, Washington DC, USA)**

Dr. Shetty delivered the expert talk on “Design Thinking and Creation of Smart Products”. He shared that in the recent trends focuses on supply chain, digital design, use of interchangeable parts, robust design, software for analysis, digital manufacturing etc.

He also added that the supply chain will make and move things faster while simulation and modeling will help to understand results and effect prior to any kind of production. Dr. Shetty also briefed about brainstorming tools - TRIZ, Axiomatic Design, Functional Analysis Tool- Morphological chart, Dunker diagram- giving information about present and desired situation etc. Innovation in product creation is the major instrument companies use to drive competition. Prototyping gives us the idea what to build while manufacturing processes gives us the idea on how to build and when we integrate them properly in product design it significantly reduces the cost, he said. He showed some product examples of his own design where simulation and these modern tools helped him a lot.

Dr. Shetty also addressed that one has to understand/ know the constraint as Design Engineer. All require to focus on Design for assembly and disassembly with respect to sustainability parameter. Promotions of the Design based activities are also crucial, he added.

During the session Dr. Shetty also discussed the various tools and techniques listed above and the book written by himself titled “Product Design for Engineers”. The book focuses on various crucial aspects of Design Engineering like Product Design Process, Customer Focus, Product

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Evaluation - Assessing Design for Disassembly and Maintenance, Product Architecture -The Impact on Manufacturing, Digital Manufacturing and Virtual Product Prototyping, Creative Concept Generation and Evaluation, Product Configuration and Design for Function, Design Evaluation - Assessing Design Assembly, Sustainable Product Design through Reliability etc.



Dr. Shetty received floral greetings



Experts discussion is going on during break time



Dr. Devdas Shetty during Key note Session on Design Thinking and Creation of Smart Products

### **Case Study - Classes at Guiyang University, China**

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by - Mr. Rohit Swarup & Mr. Ninad Shastri

Mr. Rohit Swarup and Mr. Ninad Shastri presented the case study on classes at Guiyang University, China. But before the case study they rightly said that India has different kind of Innovation strategy which we called “Juggad” and this strategy is definitely work in some cases as it solves temporary a problem but we would require a sustainable solution for Make in India products. They also talked about their i<sup>297</sup> program.

About the case study, they discussed about the level of difficulty faced by team over them due to miscommunication. The students are not only from the different disciplines but have different background, tastes and hobbies. The numbers of students from engineering discipline were few and program was prepared for the Engineering faculties keeping in mind. Then they discussed how they overcame all difficulties by blending Design Thinking strategy for building a dynamic curriculum which is based on “What to learn” and “How to learn”.

They suggested all students participants to learn from real life problems for apply engineering principles to solve them. They suggested all faculty members that every student is different with different ability and skills especially for Design, so do not judge them equally while evaluation of Design Engineering subject.

They believe that Design Thinking is a powerful tool for innovation and evaluation. It depends on co-creation and creator. To make fruitful outcome engineering with local community and to understand story of the same, interaction is very necessary. They both also added that the sensitivity towards students is key. We can enrich the ideation process as more than 300 tools are available to work on. They concluded by saying that design thinking has no rigid format but it is a common sense process.



Mr. Rohit Swarup & Mr. Ninad Shastri sharing the case study on classes at Guiyang University, China

## Session 2: Paper Presentations

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To map the learning process and realize the ground condition of the depth of the subject, two sessions on Paper Presentation by faculty members of GTU on theme “Learning from Design Experiments in GTU in pedagogy, process and its inferences” also included into the conference as we were keen to share some of the observations by the instructors which they have codified during their classroom teaching. During this first session, three papers presented and their efforts judged by **Dr. Devdas Shetty, Dr. Gnamamoorthy, Mr. Rohit Swarup and Mr. Ninad Shastri.**

*The papers presented in the session were tabulated with details as below:*

Sr. No.	Paper ID	Name of Author	College/ Organization Name	Paper Title
1	PT0013	Prof. Sudeep Sunil Kolhar	L.J. Institute of Engineering and Technology	Importance of Various Aspects In The Process Of Product Development Engineering
		Prof. Milan Jitendra Pandya		
2	PT0007	Prof. Bhasker Vijaykumar Bhatt	Sarvajanik College of Engineering & Technology (SCET)	Ideal Competencies For An Innovator Resolving A Riddle
3	PT0027	Prof. Parth N Raval	Shankersinh Vaghela Bapu Institute of Technology	Transforming India by Instilling Design Thinking as Spine of Indian Industries and Institutes



Prof. Sudeep Sunil Kolhar



Prof. Bhasker Vijaykumar Bhatt



Prof. Parth N Raval

### **Case study - Design Thinking in Project based learning**

**by - Dr. Geetha Prakash**

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**Dr. Geetha Prakash (Dean, EC Dept., Nagarjuna College of Engineering & Technology, Bangalore)** started the case study by stating that Design thinking shall be imbibed as culture. Prof. Geetha delivered talk on “Design Thinking in Project based learning – for transforming Engineering Education”. She discussed that the literature review will give adequate information regarding domain and to find out right problem statement. She added that the creativity not always come from Engineering only. It can be non-technical thing. Another crucial point is demonstration to students, selection of projects, execution of projects, collaboration between team members and learning by doing is very important aspects, as per her talk. She said that documentation of project is equally important.



Prof. Geetha Prakash given the memento as token of cherished memories



Prof. Geetha Prakash during the Case Study session



Experts discussing with participants during break



Exchange of thoughts between experts

### Session 3: Paper Presentations

Paper Presentation on theme “Learning from Design Experiments in GTU in pedagogy, process and its inferences” was included into the this second session where also three papers were

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presented and efforts judged by **Prof. Amaresh Chakrabarti, Prof. Geetha Prakash, Prof. Dinesh Korjan and Prof. Amar Gargesh.**

*The papers presented in the session were tabulated with details as below:*

Sr. No.	Paper ID	Name of Author	College/ Organization Name	Paper Title
1	PT0003	Prof. Amit Rathod	Parul Institute of Engineering & Technology	The Need And The Impact Of Using Design Thinking Teaching Methodology In Engineering Education For Digital Natives
2	PT0014	Prof. Gagandip Singh Khanduja	SAL Institute of Technology & Engineering Research	Design Based Learning In GTU Pedagogy-A Revolutionary Step Towards New Beginning
		Prof. Karmjitsinh Bihola	Gujarat Technological University	
		Prof. Jaimin Dave		
3	PT0034	Prof. Bhargav Patel	ITM Universe	Design Engineering As A Curriculum And Challenges
		Prof. Ajaysinh Vaghela		



Prof. Amit Rathod



Prof. Gagandip Singh Khanduja



Prof. Ajaysinh Vaghela & Prof. Bhargav Patel

### Session 4: Concluding Remarks

**Panel discussion on Way forward: How GTU should develop its Design Spine interventions in next semesters?**

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To catch the most inferences out of this two days conference, a panel discussion was held on how GTU and other universities in the nations should develop the Design Spine for more inclusive type of innovation in India. During the Panel discussion following experts were present and shared their views regarding the topic.

1. Dr. Akshai Aggarwal, Hon'ble VC – GTU, Ahmedabad
2. Dr. N M Bhatt, Dean, ME & PhD, GTU; Director, Gandhinagar Institute of Technology
3. Dr. Gnanamoorthy, Director & Professor of Mechanical Engineering, IIITD&M, Kancheepuram, Chennai
4. Dr. Devdas Shetty, Dean, School of Engineering and Applied Sciences, Prof. of Mech. Engg., University of the DC, Washington DC, USA
5. Prof. Amaresh Chakrabarti, Head, CPDM, IISc, Bangalore
6. Prof. Dinesh Korjan, Prof in Design, IIT-GN, Founder, Korjan Studio

**Dr. N M Bhatt** started the panel discussion by discussion of Prior Art Search for the Design Thinking and informed that looking at criticality of the same University had already included the same in the Guidelines of the subject. He wishes to have more practical case studies from the faculty members to make lectures and learning more interesting. He told everyone to focus on learning by doing things as it is more important than any success or failure during student life.

**Dr. Devdas Shetty** raises the concluding remarks to focuses at Design in small steps recalling the example of Prof. Anil Gupta. He also informed that emotional aspect of all stakeholders is very important in such methodology. Faculty participation is the key for the success of Design Thinking initiation. To enrich the program one should take feedback from stakeholders to meet goals and objectives.

**Prof. Amaresh Chakrabarti** said that the Design Thinking means putting frame work and at the same time implementation with prototype is important. Collect the data from faculty members and students both and after analyzing the same in various ways to make conclusion which may lead towards better outcome in future. He also informed to pay attention at genuine challenges occurred during the implementation of such process/workshops. We have to evaluate failures also and if possible have to give reward to same with view of encouragement, he added.

**Dr. Gnanamoorthy** touched the audience by saying that all are facing resistance from stakeholders for such initiation and it's not surprising even in IITs/NITs. The biggest challenge is the change of mindset. His emphases that please teach to interested faculty members only; there is no need to teach everyone. Design Thinking is not domain specific but interdisciplinary, he added. He also informed that it is not necessary to take high end problem by students every

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time, they may select daily life real problems and try to find out solutions with available technical knowledge by applying Design Thinking methodology.

**Prof. Dinesh Korjan** also agreed that there is huge challenge in implementation with big mass as far as affiliating type universities are concerned. The answers will be available by asking more and more “Why” and one will get more answers to support the thinking and move ahead. Learning Design is the best part, he concluded.

**Dr. Akshai Aggarwal** assured that University will achieve all the heights of success for such initiatives with support and collaborations from four pillars of university i.e. faculty members, students, institutes and university itself. He also took into account the advice of all experts and motivated the Design Team to implement feedback from all the concerned stakeholders in the matter and to design feedback forms especially for students. The research would be performed on the collected feedbacks to move ahead for success. Dr. Aggarwal thanked all the experts for their valuable feedback and time during two days conference.



*Concluding Panel Discussion: Experts have discussed and shared their views on “How Design Spine in Engineering Education can be developed”*

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### ***Valedictory & Prize Distribution***

In the valedictory, faculty members were awarded for their efforts for Design Research paper. During the paper presentation, Jury Panel has selected the three best paper and presentation for their efforts and implementation of Design Engineering in GTU pedagogy. The awards were given to (1<sup>st</sup>) Prof. Amit Rathod; (2<sup>nd</sup>) Prof. Sudeep Kolhar & Prof. Milan Pandya; (3<sup>rd</sup>) Prof. Parth N. Raval.



1<sup>st</sup> Prize: Prof. Amit Rathod



2<sup>nd</sup> Prize: Prof. Sudeep Kolhar & Prof. Milan Pandya



3<sup>rd</sup> Prize: Prof. Parth N. Raval

### ***Vote of Thanks***

The vote of thanks was delivered by Prof. Jaimin Dave, Assistant Professor, GTU-Open Design School, thanking all the dignitaries and experts who could spend time from their busy schedule, for their sharing and motivation to all participants and who believe that Design Thinking is future for innovative culture. He also thanked all participants who stayed with us for two days and listened the experts patiently and provided feedbacks. He then thanked all the team members of GTU whom efforts made this event a great success.



Prof. Jaimin Dave expressing Vote of Thanks

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### *Major Learnings of the Conference are*

- ✚ Design Thinking is a powerful methodology that can benefit individuals, economies and societies; it helps apply multiple viewpoints to a problem.
- ✚ The major problem in the path of Design Thinking/ Engineering is “Change in Mindset”.
- ✚ To achieve the objective of the Design thinking, we have to make habit of looking at problems as opportunities.
- ✚ Students are one of the most important stakeholders in the process and hence they have to feel the ownership for their projects and start to believe that they can be able to achieve the tasks given to them. Faculty members will only play the role of facilitator.
- ✚ Design Thinking is the philosophy/mindset; it can be learned while doing the things. There is no right or wrong design; it is only a good or bad design.
- ✚ Empathy is the key to success in Design Thinking. One has to take position of the things/ person in the pain to look at the things from that prospective to give solution an innovative flavour.



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### Core Team of Conference:

#### **Chief Patron:**

Dr. Akshai Aggarwal  
(Vice Chancellor, Gtu )

#### **Patron:**

Dr. N. M. Bhatt  
(Dean GTU, Director GIT)

#### **Convener:**

Karmjitsinh Bihola  
Assistant Professor,  
Centre for Industrial Design, GTU

#### **Co-Convener:**

Jaimin Dave  
Assistant Professor,  
Centre for Industrial Design, GTU

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### Technical Committee:

Prof. Tosha Shukla  
Prof. Rutika Ghariya  
Prof. Raj Hakani  
Prof. Mitesh Solanki  
Prof. Hemal Nayak  
(Assistant Professor, CiC3, GTU)  
Juned Shaikh

### Design Associates:

Jay Shah  
Rajput Mitesh  
Keshwai Awadhwas  
Bhaktdasi Patel  
Abhishek Kenchgundi  
Akshay Kothari  
Meet Shah  
Ketan Patel  
Parth Patel  
Dhwani Gadhewal  
Varsha Thakur  
Dhruvin Bhatt  
Jeet Parikh

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