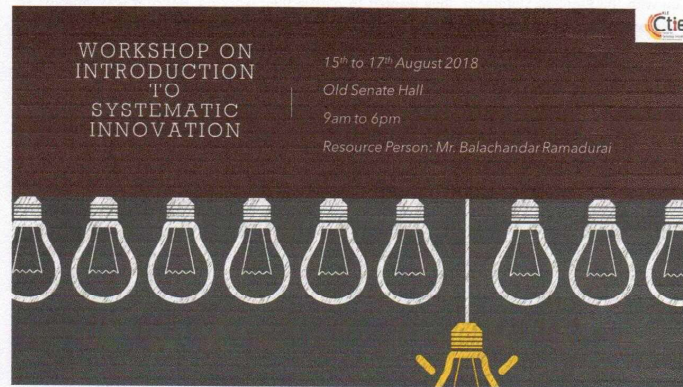


## 74.Workshop on Introduction to Systematic Innovation

**Title :** Workshop on Introduction to Systematic Innovation

**Date :** 15th, 16th and 17th August 2018

**Banner/ Brochure :**



**Photos :**



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## 74. Workshop on Introduction to Systematic Innovation

### Details of the Program/Report:

The workshop was our first step towards thinking of the solution for the problem statements we had.

The students post completion of Course 1 of Minor in Entrepreneurship, had spent enough time in coming up with the Problem Statement, they wanted to pursue their work on. Hence it was time to venture into possible solution these problems could have.

On day one, Dr. Balachandar Ramadurai, took us through basics of Systematic Innovation. His belief was if Innovations are not systematic, then we are bound to wander to arrive at possible solutions.

The resource person stressed on the fact that if ideas are implemented they should lead to sales/revenue from the customer.

Then he spoke a little on Innovation and why innovations are typically depicted by a bulb. The history behind it being Edison innovated bulbs and did not invent it, which is what people think it to be. The bulbs were invented about 40 years before Edison decided to innovate them. However, these bulbs would last for few minutes and not last long enough to illuminate the surrounding. It was only after conducting about 1000 unsuccessful attempts he finally could come up with tungsten being a filament that enhances the life of a bulb. So here again, he was doing multiple trial and errors to deal with the problem.

He then showed us the picture of Shivanasamudram Water fall, Karnataka and narrated history behind it as to how Asia's first hydro – electric power plant was commissioned in the year 1902.

Innovations are hard, unpredictable and difficult to learn, so he threw a challenge to the audience as to how to make innovations easy, predictable and easy to learn.

He illustrated an example on guess a number, and introduced constraints like, is it less than 100, is it greater than 50, divisible by 5 and should be even. The possible numbers are 60, 70, 80, 90. By introducing constraints we have 4 choices as compared to infinite. Hence systematic innovation helps to be precise to the solution. He quoted saying, it matters not how many ideas you have, it matters WHAT ideas you have.

The resource person then explained us, how trial and error method as compared to systematic approach, could lead to very vague conclusions and arriving at appropriate solution would be time consuming. And how systematic approach helps to identify constraints that point to solutions.

He asked the participants to guess a number – a three-digit number, that he has thought of in his mind, the scope was between 100 to 999. By applying systematic approach to it and applying necessary constraints, students started applying binary search to guess the number. They went about to ask, whether number is greater than 500 or less than 500, then whether the number was greater than 700 or less than it, then 600, then 650, then even/odd, divisible by 3,5 and finally arriving at number to be 679.

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Then he discussed, four steps towards Innovation viz, People via Empathy, Problem via Analysis, Solution via Creation, Concept via Make /Test.

We then moved to applying systematic approach towards guessing the city in the world. Though there was initial deviation, random guesses of the city names, through Systematic approach, we tried guessing the continent, then asked if the country was surrounded by sea or no, then asked which hemisphere does it lie in, then asked the alphabet the country name starts with, is it vowel or no, then asked if it is a capital city of the country, knowing the continent, the hemisphere, the first letter of country, we guessed country name to be Ukraine and city being Kiev.

Then we applied systematic approach on guessing the object present in the room which is 3 – dimensional. We applied systematic approach, in verifying the color, its placement in the room, and guessed it to be projector.

Systematic Approach is like solving a multi-dimensional puzzle. People who come up with great ideas are the ones who work close with the customer and know how to crack it and figure out a need.

The objectives of the workshop were then laid out as:

- You will be able to recall phases and steps of systematic innovation (SI)
- You will be able to match phases and steps of SI to the descriptions
- You will be able to apply some of the tools of SI to real problems

Then we had groups present their problem statements to us. **The resource person had asked the teams to present on the following points.**

- Context - Why do we need your idea to work?
- Imbalance - What's wrong with the current context of your idea?
- Balance - How can your idea become irrelevant?
- Solution - How does your idea bring balance (point 3 above) from the state of imbalance (point 2 above)?
- Please prepare a presentation you can talk about for 8 minutes (Represent points 1, 2, 3 and 4 on a chart paper using pictures/visuals/drawings)

With this we ended day one of the workshop.

Day 2 of the workshop dealt with 5 - Whys and Conflict analysis.

The multi why's also known as Toyota's 5- Whys approach was illustrated with an example.

Why does a student come late to class regularly?

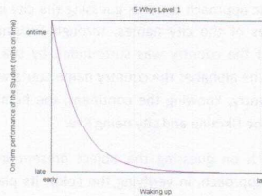
Level 1 - The student comes late to class because they woke up late (assumption – if they woke up early they would be on time to the class)

  
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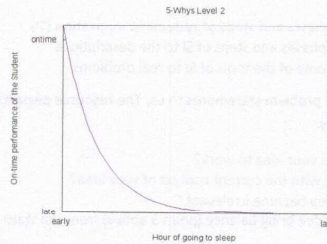
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If you plot a graph with student waking up early to late versus on – time performance of the student, it would look as below:



Reference - <https://balaramadurai.net/kdt/KLETech-Aug-2018.html#/slide-orga34c1fe>

Level 2 – They woke up late because they slept late. (assumption – if they slept early, they would wake up early and hence be on time for the class). Plotting the graph would look like below.



Reference - <https://balaramadurai.net/kdt/KLETech-Aug-2018.html#/slide-orga34c1fe>

Level 3 – They slept late because they have too many deadlines for the courses (assumption – if they had less deadlines for courses, they would sleep early they would wake up early and hence be on time to classes)

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5-Whys Level 3

Reference - <https://balaramadurai.net/kdt/KLETech-Aug-2018.html#/slide-orga34c1fe>

We clearly see that there is a conflict of things here. And hence resolving a conflict in a systematic way helps arrive at possible solutions.

The resource person illustrated conflict analysis using an example of Partho's, one of the three Musketeers. So Partho's, loved to wear fancy clothes however, if the tailor measured his measurements by touching his body, off would go the head of the tailor, as Partho's hated someone touch him. But the need of fancy clothes would still be unfulfilled. Had Partho's not allowed his measurements been taken perfectly the clothes wouldn't fit him well.

Hence, he asked us, what could be the possible ways to take measurements. The audience replied saying, we could measure the existing clothes and stitch new clothes, few said we could measure a similar built person, crazier to that would be making Partho's stand in front of the mirror and measure his measurements.

For the given situation if we represent a conflict analysis diagram, it would appear as below:

**CONFLICT OF INTEREST - EXAMPLE**

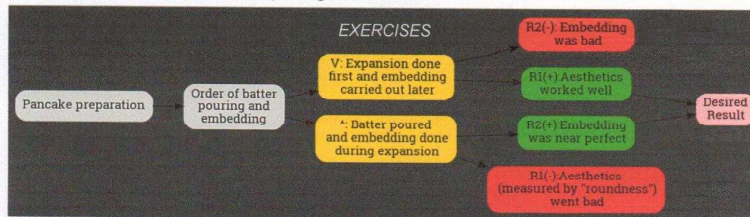
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Reference – <https://balaramadurai.net/kdt/KLETech-Aug-2018.html#/slide-orga34c1fe>

Another illustration of conflict analysis diagram would be:



Reference – <https://balaramadurai.net/kdt/KLETech-Aug-2018.html#/slide-orga34c1fe>

The resource person then took us through three scenarios (Student not paying attention to teacher in class, Space shuttle landing – friction at tier, Hershey Chocolates – world-wide reach – maintaining the consistency of the chocolate) and asked us to write 5 – Whys and conflict analysis at each level of whys.

Then came Task 2 for the students, which is as below:

- Reuse content from Task 1
- Present to us your results of the Multi-Why and Conflict analysis
- No solutions, please
- Please prepare a presentation you can talk about for 8 minutes (Represent points 1, 2 and 3 on a chart paper using pictures/visuals/drawings)

The students made a team presentation on the above points.

The resource person then inclined towards solution identification for the defined problem. He discussed effectiveness of Brainstorming as a tool to come up with possible solutions. The students were then presented with Task – 3 (First Cut towards Solution)

- Reuse content Tasks 1 and 2 - problem, multi-why and conflict analysis
- What are your ideas to resolve the conflict?
- What could be potential problems if your idea were implemented on the field?
- Please prepare a presentation you can talk about for 8 minutes (Represent points 1, 2 and 3 on a chart paper using pictures/visuals/drawings)

This made students dig deeper into the problem and the possible solution they had thought off.

He then introduced us to Patent searches and discussed why they are important.



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He then informed us to do patent searches for the solution we have come up with for the problems.

With this he introduced us to Genrich Altshuller, notable for the creation of Theory of Inventive Problem Solving, its Russian acronym being TRIZ. Working as a [clerk](#) in a [patent office](#), Altshuller embarked on finding some generic rules that would explain creation of new, inventive, patentable ideas. He eventually created the TRIZ.

The resource person discussed how TRIZ can be used to solve conflicts. He discussed few commonly used principles and encouraged participants to think on these lines to arrive at possible solutions. Example:

Principle 10.

Preliminary Action –

Perform, before it is needed, the required change of an object (either fully or partially)

Eg. Sterilize all surgical instruments needed for a surgical procedure on a sealed tray.

Pre – arrange objects such that they can come into action from the most convenient place and without losing time for their delivery.

Eg. Kanban arrangements in a Just-in-Time factory

Principle 11.

Beforehand cushioning –

Prepare emergency means beforehand to compensate for the relatively low reliability of an object.

Eg. Back-up parachute

Principle 13.

The other way around

Invert the action(s) used to solve the problem

Eg. Instead of cooling an object, heat it

Make movable parts (or external environment) fixed, and fixed parts movable.

Eg. Treadmill – for walking or running in place

Turn the object or process 'upside down'

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Eg. Empty grains from containers (ship or railroad) by inverting them

He showed some videos on TRIZ principles and how the solutions can turn around the problem.

He then asked us to apply these principles on the three scenarios discussed earlier. After having one to one discussion, he led us to Task – 4, which is as below:

- Reuse the material from Task 1, 2 and 3
- Analyse your potential problems from Task 2 using
- Multi-Why
- Conflict of Interest
- Explore the patent database to find out some patents in your field
- Rewrite your ideas and conflicts
- Please prepare a presentation you can talk about for 8 minutes (Represent points 1, 2, 3 and 4 on a chart paper using pictures/visuals/drawings)

Upon student's presentation, he introduced us to proposal writing and how it would be like. The main parameters being:

- Core Problems being solved
- Features of the concept
- Team experience / Composition
- Success Criteria
- Executive Summary
- Next action and Environment Changes

This led to Task – 5 being as below:

- Use content from Task 1, 2, 3, 4 and write a proposal with the following heading:
  - Executive Summary of your concept (Short paragraph of your entire proposal)
  - Problem (Specify conflict)
  - Features of your concept
  - Team experience (and composition)
  - Success Criteria (Measurable)
  - Next action to get this project off the ground

This was the task the teams were supposed to come prepared with for next day. With this day – 2 ended.

On Day – 3 students were asked to work on their proposals and do a round robin presentation for three rounds. By this way the quality of presentations would improve, and newer perspectives would be provided by reviewing teams for the problems and solutions under consideration. He called it Bullet – Proofing:

- Select one presenter per team, Present your concept to another team – One way – 8mins

  
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- Turn around and listen to all the feedback – One way – 8 mins
- Address all the feedback with your team, Get ready for next round – Group – 8mins

Each team was asked to evaluate other team and rank them. The parameters to consider were Presentation Style, Business Viability, Problem Desirability, Solution Feasibility.

With this he left the teams with the final task. The task being

- Take your favourite newspaper
- Take an article that you really liked
- Write a **new** article of your entire case (Content from Task 1, 2, 3, 4 and 5) as if it were a report in a newspaper
- A checklist of potential items in your writeup
  - A personal story
  - Some startling fact(s)
  - A few quotes from real people
  - A fancy headline
  - A byline
  - Overall summary at the end
  - Email me your news stories

Day – 3 and the workshop ended with this.

The participants learnt to summarize the ideas and provide suitable solutions to it. Though the solutions proposed may not be exactly the one they wish to implement, the thinking process has started so that they now are capable to venture systematically into arriving at appropriate solution.

**Number of Participants: 21**

**List of Students Participated:**

1	01FE16BCS112	NAMITA RAYANGOUDAR
2	01FE16BME110	NISHANTH B S
3	01FE16BCS030	ANANNYA HANJI
4	01FE16BCS197	SHYAM SUNDAR AGARWAL
5	01FE16BME121	PRAJHOT R NAIK
6	01FE16BEE076	RAJAT MEHTA
7	01FE16BME056	HARISH A VERNEKAR
8	01FE16BME062	JUSTIN AUGUSTINE PINHEIRO
9	01FE16BME207	SURAJ REDDY
10	01FE16BAR036	SAMARTH TIKARE
11	01FE16BCS241	MEGHA KOUJAGERI
12	01FE16BCS087	KAJAL JAIN
13	01FE16BCS243	PRIYANKA NABAPURE

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14	01FE16BCS072	GREESHMA KATARKI
15	01FE17BEC418	MANJUNATH H M
16	01FE16BEC044	ATHEETH A NAIK
17	01FE16BEC195	SWATHI BASAVARAJ D
18	01FE16BEC003	AKANKHSA PATIL
19	01FE16BEE057	NEETU DESHPANDE
20	01FE16BEE039	KEERTI KAMAT
21	01FE17BME418	KANAVI PUNIT Y

  
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