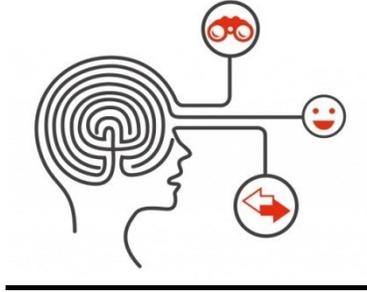


Escapade of



Design Engineering

“Mind over the matter”

2014

BY

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DEPARTMENT OF INFORMATION TECHNOLOGY



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PREFACE

This document is designed as an introduction of how Design Engineering works so remarkable with 2nd level students of Engineering so that they have come up with an amazing product design. It is intended for use in an introductory design course in engineering with the objective of providing some hands-on experience for students who are really interested in exploring a real engineering a part from only bookish knowledge.

This document is prepared based on my experience while I am doing this entire activity with the students at **G H PATEL COLLEGE OF ENGINEERING AND TECHNOLOGY**. I am so amazed by the response I received from the students while I was doing it. I am really very thankful to **GUJARAT TECHNOLOGICAL UNIVERSITY** and **GTU INNOVATION COUNCIL** for such a nice experience of FDP. Also I would like thank Head of IT Department **GCET Prof. Nikhil Gondaliya Sir** for his continuous support and remarkable trust in my abilities to handle this course the way I want to do it. Lastly very special thanks to the Head of Institute **Dr Himanshu Soni Sir** for constant motivation guidance support.

Rajvi Parikh
Assistant Professor.
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BASIC IDEA BEHIND ACTIVITY:

If you take a moment to observe your surroundings, you will see examples of technological creativity. The physical objects you see, whether they are telephones, automobiles, bicycles, or electric appliances, all came into being through the creative application of technology. These everyday inventions did not miraculously appear but originated in the minds of human beings and took time to develop. Engineering is the creative process of turning abstract ideas into physical representations (products or systems). What distinguishes engineers from painters, poets, or sculptors is that engineers apply their creative energies to producing products or systems that meet human needs. **This creative act is called design.**

OBJECTIVE:

To enhanced the capabilities of students to think on design perspective. This is such an extraordinary experience for engineering students that will make him so sure about there career by the time they graduate from the institute .these four years are truly remarkable for them to decide the journey of ones life.

DESIGN THINKING:

"Design thinking is a lineal descendant of that tradition. Put simply, it is a discipline that uses the designer's sensibility and methods to match people's needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity. Like Edison's painstaking innovation process, it often entails a great deal of perspiration. I believe that design thinking has much to offer a business world in which most management ideas and best practices are freely available to be copied and exploited. Leaders now look to innovation as a principal source of differentiation and competitive advantage; they would do well to incorporate design thinking into all phases of the process."

- **TIM BROWN**

ENGINEERING DESIGN

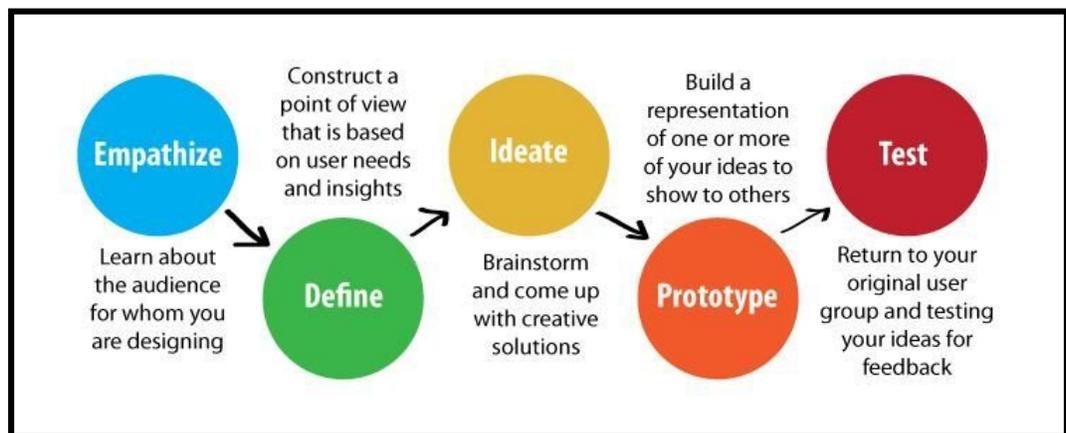
Most engineering designs can be classified as inventions-devices or systems that are created by human effort and did not exist before or are improvements over existing devices or systems. Inventions, or designs, do not suddenly appear from nowhere. They are the result of bringing together technologies to meet human needs or to solve problems. Sometimes a design is the result of someone trying to do a task more quickly or efficiently. Design activity occurs over a period of time and requires a step-by-step methodology. We described engineers primarily as problem solvers. What distinguishes design from other types of problem solving is the nature of both the problem and the solution. Design problems are open ended in nature, which means they have more than one correct solution.

The result or solution to a design problem is a system that possesses specified properties. Design problems are usually more vaguely defined than analysis problems. Suppose that you are asked to determine the maximum height of a snowball given an initial velocity and release height. This is an analysis problem because it has only one answer. If you change the problem statement to read, "Design a device to launch a 1-pound snowball to a height of at least 160 feet," this analysis problem becomes a design problem. The solution to the design problem is a system having specified properties (able to launch a snowball 160 feet), whereas the solution to the analysis problem consisted of the properties of a given system (the height of the snowball). The solution to a design problem is therefore open ended, since there are many possible devices that can launch a snowball to a given height. The original problem had a single solution: the maximum height of the snowball, determined from the specified initial conditions.

DESIGN ENGINEERING PROCESS

It includes basically five steps:

1. Empathize various real life situations
2. Define Problems
3. Ideate Problems solutions
4. Prototype solutions
5. Test solutions



To achieve this process as per GTU course we are having three Canvases i.e.

1. Empathy Mapping Canvas
2. Ideation Canvas
3. Product Development Canvas

DESIGN ENGINEERING JOURNEY (17-19 NOVEMBER 2014):

"I have planned to make this Process so joyful for the students so that they have come up with lots of ideas. And have an exposure of entirely new approach of learning through subject.

The activity started at around 3 pm afternoon in drawing hall and last up to 9:30 sometimes 10 Pm for three days continuously. This is the only available free time when we can have drawing hall occupancy for 6 to 7 hours continuously so I have to keep this time slot for this activity.

With all my surprise I have received almost double enthusiasm and efforts from students than I have expected. It was so memorable journey for me as well. It was so unforgettable experience for me that will always says if faculty put her/his genuine efforts for anything that will create magical interest among the students, faculty will definitely get larger than the life responses from students. But of course as a faculty you have to put lot of efforts to achieve this reaction from students. I have received tremendously stupendous response from the students.

As decided, All are 2nd year IT students did the there canvases with in campus and they enjoyed it so much doing it that they really don't want to leave the place even its almost 10 pm and its too late to return to hostel. That is biggest achievement. I would love to share this that even its late students don't bother about here food they were so in to the process of making canvas"

Each canvas has its own wonderful design that came out from any empathetic situation of real life it was so difficult for me to select best five designs.

Rajvi Parikh.

Student's feedback regarding Design Engineering:

- This is whole new experience in the college; it has allowed us to bring out the hidden ideas & talent which we have. This is not about attending lecture & writing notes, it's just all about having an interactive, creative. **Shalini Maliwal**
- In the design engineering subject is very much great idea in new developing. In this subject you think much better and in new way too & I hope this subject is return in upcoming semester **Kuldeep Kabariya**
- Design engineering is a field where new different innovative ideas come together & they build up an effective invention. It was like a mind exercise for me. It was a fun. **Jhanvai Pandya**
- This canvas making activity is like a mind game. By this activity we can build our mind in many ways thinking some innovate etc. It was a great fun and I enjoyed my 3 days very much. **Juhi Nander**
- It is the subject that gives us a platform to show our inner potential & capabilities. We can really make our mind 'RUN'. **Ishani Sojitra**
- This subject shows us a different bright way to create, to think, to become innovative that we are the innovative future engineers. Through this subject we learn to work in team and use our different ideas. **Aarefa Bhurka**
- It is subject that gives us an opportunity to develop our practical knowledge & technical knowledge. It also makes us learn to work in team. **Jankhruti Kikani**
- It is a subject that gives us a platform to show and develop our inner potential and teach us how to work in a team with different ideas. **Vidhi Amin**
- Design Engineering is a good task to have in an engineering college. It helps enhance students to think more and be more creative. **Lizza Parmar**
- First time feeling like primary school in college days. We had lots of fun in canvas making. It helps to improve our imagination skill. It is also teamwork so that is so good. Many ideas are better than one idea. **Zankhna Patel**
- This subject is very good for engineering students as it helps us to innovate and to build new ideas in young mind. **Munaf Vhora**
- A platform that enforces creativity along with the innovation to help society in a better way with our ideas. **Amit Tiwari**
- A platform that allows us to think out of the box and create new ideas and new creativity. It also helps us to develop skills to work in group. **Harsh Parekh**

- It pressurized our mind to come out of "bookish" knowledge think about new possibilities for better future. **Aakash Varia**
- Design engineering proved that I am an engineer, and I can create anything which I think. **Rushiraj Brahmbhatt**
- It will very helpful to know a problem which we will face in future in software development. **Zeal Shah**

:::PHOTO GALLERY:::

Day 1: Empathy Mapping Canvas:



**Prof Rajvi
Parikh Guiding
students for
making Empathy
mapping canvas**





**Enthusiasm
energy and
enjoyment
among the
students for
making
canvas**



Day 2: Ideation Canvas:



**HOD IT Prof
Nikhil Gondaliya
Sir giving his
comments to
students.**





**Prof Rajvi
Parikh guiding
Students for
making Ideation
Canvas**





**Prof Rajvi
Parikh guiding
Students for
making Ideation
Canvas**





Prof Rajvi Parikh
giving ideas and
comments to students
for making an
Ideation Canvas



Day 3: Product development Canvas:



**HOD Prof Nikhil
Gondalya Sir
motivating students**

**Prof Rajvi Parikh
Evaluating Product
Development
canvas**





Prof. Saurin Sheth giving his ideas to students.



Enjoying light refreshments sponsored by HOD sir Prof Nikhil Gondaliya



Prof Bhargesh Patel giving his comments on Product Development canvas



Keeness
Excitement
of students
at 10 pm



Happiness of
getting A++





Prof Bhargesh
Patel giving his
ideas for Product
Development.

RECAPITULATION

Design engineering is the perfect epitome of how an engineer exactly have to be, but it can achieved properly only if the faculties put there tremendous efforts in it. This activity can really create an Engineer who can think who can build who can create and change the phenomenon of society.