

# GUJARAT TECHNOLOGICAL UNIVERSITY

Chandkheda, Ahmedabad  
Affiliated



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A  
Project Report on

**(TOPIC)**

prepared as a part of the requirements for the subject of  
**DESIGN ENGINEERING – I b**  
B. E. II, Semester – IV (XXXXXX Branch)

Submitted by: Group:

Sr. Name of student Enrollment No.

CCCC DDDD EEEE  
(Faculty Guide)

AAAA BBBB CCCC  
Head of the Department

Academic year (2014-2015)

# GUJARAT TECHNOLOGICAL UNIVERSITY

Chandkheda, Ahmedabad  
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**DEPARTMENT OF civil ENGINEERING**

## **CERTIFICATE**

*This is to certify that Mr./Ms. \_\_\_\_\_  
Enrollment No. \_\_\_\_\_ of semester \_\_\_\_\_ has  
satisfactorily completed the laboratory work in the course DESIGN ENGINEERIN-1A  
within the four walls of the Institute.*

**Date of submission:** \_\_\_\_\_

**Faculty In-Charge**

**Internal Examiner**

**External Examiner**

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4	Ideation Canvas
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# 1. INTRODUCTION:-

Our team ( ) was assigned the work of innovating something under the newly designed syllabus of design engineering-1A.

Team members (description)

Sr. no.	Name	Enrollment no.	Sem & Branch
1			
2			
3			
4			

## Design Engineering & Design Thinking

(Importance & Socio-economical relevance)

**Design Engineering** is a general term that covers multiple engineering disciplines including electrical, mechanical, chemical engineer, aeronautical engineer, civil, Computer Engineering, Information Technology and structural/ building/ architectural engineers. The uniting concept is a focus on applying the 'engineering design process, *in which engineers develop new products or processes with a primary emphasis on functional utility.*

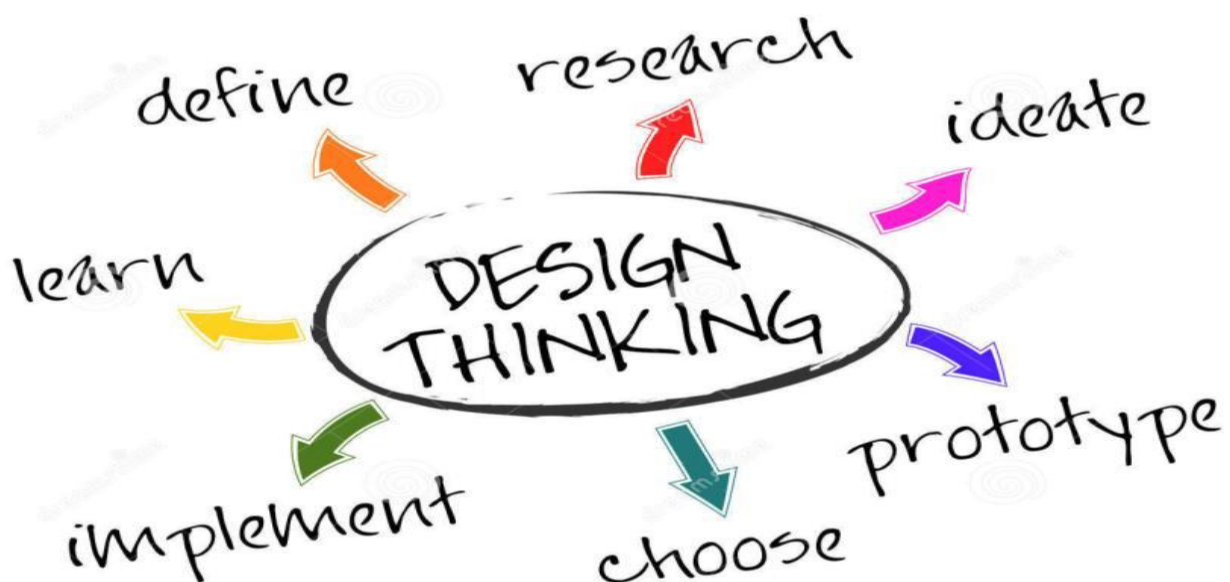
Design is a plan of a system, its implementation and utilization for attaining a goal. It is to change undesired situation into desired situation means to find solution for undesired/uncomfortable situation.

*Design Engineering is based on globally accepted Design Thinking methodology.*

**Design Thinking** is "matching people's needs with what is technologically feasible and viable as a business strategy". Design Thinking is incorporates that by knowing about how to successfully approach and solve difficult, multi-dimensional problems - more specifically, effective methods to ideate, select and execute solutions

Design thinking is a new human centric approach of looking at problems & solving them. Engineering has for long been at the forefront of human quest for progress and solving its problems. However in the 21st century as the age of mass production declines and as individual customization increases, what engineering does will be redefined. What an individual thinks and feels about will become the intangible and most important components of new goods in our economy. Innovation in that era will be human centric. Design thinking in engineering is to recalibrate engineering for this new era. It will be the mind over matter era.

One version of the design thinking process has seven stages: define, research, Ideate, prototypes, choose, implement, and learn. Within these seven steps, problems can be framed, the right questions can be asked, more ideas can be created, and the best answers can be chosen. The steps aren't linear; can occur simultaneously and be repeated.



# TEAM BUILDING

As per our team...

Team building is part of a psychological discipline called organizational psychology. It inspires groups of workers to communicate through a series of planned events that are fun & motivational. These events can be used to determine strong points in an individual's personality, such as leadership skills.

Team building also benefits the team as a whole. When people who rarely work together are forced to communicate, they can discover that they enjoy the interaction & continue to network & bond with different people back at the office. Those who previously may not have been getting along will have to forget their differences in order to overcome an obstacle & their dislike is be diminished as the work together for a common goal.

As we have worked together in Design Engineering workshop, we found it very useful. We think that this subject is very essential in our day to day life. By studying this subject, we can identify real time problems or we can say it as user's problem. Also we can understand how to find solution of user's problem. By making this all canvas models, we can understand design flow of any product.

We learnt new things and also how to create innovative things, bring out innovative ideas from our own minds.

*Creativity is playing an ever more important role in the success or failure of organizations in the global competitive economy. The field of engineering is no exception.*







## 2. EMPATHY MAPPING:-

Now, we describe our observation about *topic name* through 4 Canvases. Our first Canvas is AEIOU FRAME WORK (sheet 1),

AEIOU is an investigative tool to help interpret observations gathered by ethnographic practices in the field. It is a frequently used framework for guiding and structuring observational research. The framework creates taxonomy of observations under the themes of *Activities, Environments, Interactions, Objects and Users* and is commonly used for coding observational data.

Organizational frameworks help researchers and designers to capture key details in observation, and AEIOU is a very easy mnemonic device to remember what to look for and write down. The structure is also a helpful framework for using observational material in design and innovation workshops.

# Activity

Activities are goal directed sets of actions—paths towards things people want to accomplish. What are the modes people work in, and the specific activities and processes they go through?

In this part we go at our domain related place and we observe different activities happening at that place.

- ✍ We mention elements by which they do such activities.
- ✍ We also write such activities which is special or happening occasionally.
- ✍ We stick photographs or sketch of our observation.

(Snapshot of Activity section)

# Environment

Environments include the entire arena where activities take place. What is the character and function of the space overall, of each individual's spaces, and of shared spaces?

In this part we describe-

- ✍ Where (Activity) is happening?
- ✍ What are circumstances?
- ✍ Time effects, Seasonal effects, Person effects, Operational effects & style, materials & atmosphere...

(Snapshot of Environment section)

# Interaction

Interactions are between a person and someone or something else; they are the building blocks of activities. What is the nature of routine and special interactions between people; between people and objects in their environment, and across distances?

We describe in this part-

- ✍ Who are involved? Why? How?
- ✍ What (users) are holding/ operating/ using...
- ✍ How the contacts are in action?
- ✍ Action vs. Reaction...

(Snapshot of Interaction section)

## Observation

Objects are building blocks of the environment, key elements sometimes put to complex or unintended uses (thus changing their function, meaning and context). What are the objects and devices people have in their environments and how do they relate to their activities?

In this part

- ✍ What components are involved?
- ✍ How objects are relating to the activities?

(Snapshot of Observation section)

## Users

Users are the people whose behaviours, preferences, and needs are being observed.

- ✍ Who is there?
- ✍ What are their roles and relationships?
- ✍ What are their values and prejudices?
- ✍ List of identified people involved

(Snapshot of Users section)

Our 2<sup>nd</sup> sheet is EMPATHY MAPPING CANVAS

Empathy Map is the canvas where designer has to observe and understand the emotional needs of the user, and on the basis of empathy of user he will think of the solution. A User Empathy Map can help tee up a discussion about the needs a user has. The discussion will be center on what was observed, and what can be inferred about these user groups' beliefs and emotions. An empathy mapping is a tool which helps us summarize our observations and take out unexpected ideas with no restriction & any bound.

Here, User is who is going to use our solution, research or analysis.

In this stage, we find the various users which are directly or indirectly related to our project.

for example:

Stakeholder is a person, group or organization with on interest in a project

In this stage, we find the user who will directly or indirectly related to users. For example: owner of Building

(Snapshot of Stakeholder section)

In **Activities** session we describe daily routine of user.

Activities are directly or indirectly related to stakeholders.  
(Snapshot of Activities section)

## **Story Boarding**

In this part we write 4-5 incidents in life of users based on our observation of users

(Snapshot of story boarding)



## MIND MAPPING

A mind map is a diagram used to visually organize information. A mind map is often created around a single concept, drawn as an image in the center of a blank landscape page, to which associated representations of ideas such as images, words and parts of words are added. Major ideas are connected directly to the central concept, and other ideas branch out from those.

Mind maps can be drawn by hand, either as "rough notes" during a lecture, meeting or planning session, for example, or as higher quality pictures when more time is available.

### 3. SECONDARY RESEARCH & DIACHRONIC AND SYNCHRONIC ANALYSIS TOWARDS PROBLEM DEFINITION

Synchrony and diachrony are two different and complementary viewpoints in linguistic analysis:

a diachronic approach considers the development and evolution of a language through history. The word is built on the Ancient Greek words δια "through" and χρόνος "time". Historical linguistics is typically a diachronic study.

a synchronic approach considers a language without taking its history into account. The word is built on the Ancient Greek words συν "with" and χρόνος "time". Synchronic linguistics aims at describing language rules at a specific point of time, even though they may have been different at an earlier stage of the language. School grammar typically uses a synchronic (as well as prescriptive) approach.

## 4. IDEATION CANVAS

Ideation is the creative process of generating, developing, and communicating new ideas, where an idea is understood as a basic element of thought that can be visual, concrete, or abstract. Ideation comprises all stages of a thought cycle, from innovation, to development, to actualization. As such, it is an essential part of the design process, both in education and practice. He explained how things can be connected to get a better idea.

An ideation canvas is a rough whiteboard/sheet where ideas can be stretched into any limits or dimensions. Ideation session is not aimed at finding solutions to the defined problem. But its aim is to define the best possible problem and stretch out its possible scope. The field is set and the overall agenda is to build the clones of the ideas and pivot them throughout the canvas so as to discover new possibilities.

In this canvas (sheet-3), we mentioned

### People

We write down distinct people we can think of or we are interested to solve problems for. We segment them into various groups on the basis of their profession e.g. Teachers, doctors, athletes. Similarly segment them on the basis of their age, income and other characteristics.

Whom we mentioned in empathy canvas as user

(Snapshot of People section)

## Activities

We write down whatever every segment of people do (Activities we had identified at empathy stage (expanding list of user activities)). We make the list, as long as possible- for example teachers: teach, take attendance, prepare class notes, prepare presentations, grade students, evaluate answer sheets and prepare question papers. Similarly; Shoppers, window shop, compare prices, visit stores, return defective goods, claim warranty etc.

(Snapshot of Activities section)

## **Situation/Context/Location**

Every above mentioned activity can be done in a different situation, location or context. For a teacher – evaluation can be of either subjective or objective papers. At other times it could be of project reports. Evaluation can be either paper/document based or for continuous class behavior which depicts different contexts.

In short, when/why/where- Many activities that user does can vary depending upon changes in situation, location or local condition/context

(Snapshot of This section)

## Props/Possible Solution

We note down the objects, technologies or solutions which may be possible outcomes to our idea/challenge. The prop need not be related as it's always randomness that helps in finding new ideas. Consider an example where you are thinking about teachers and throw in a random solution like chemical reagent. Here as mentioned above the randomness in ideas can be implemented. Adding up People: Teacher > Activity: Evaluation > Situation: Subjective answer sheets; to the chemical reagent gives you a special pen based on acidity that makes the teacher comments tamper-proof.

In this we write down non living things or items (components)

(Snapshot of Props)

# 5. PRODUCT DEVELOPMENT CANVAS

This exercise is meant for giving strategic orientation to the project of each team so that it achieves its true goal as defined by the previous canvas exercises. This exercise is more about developing strategy for the proposed product/solution design, after the team has successfully attempted the ideation process and has incorporated inputs from all stakeholders.

A product development canvas is the ground where in the best possible ideas after the ideation session are pitched and nurtured to develop.

## People

We make the segment more focused. We note down the kind of people we have in mind while developing the product and also the people for whom we are resolving the problem.

## Purpose

The section should answer the following questions: What is the broad purpose of our product? What problem sector we want to target broadly or specifically? For e.g. you may want to target transport sector or you may want to come up with options for Healthier foods. If you already have a specific purpose, then go ahead with it. Like solving the problem of measuring footfalls in a retail store or measuring consumer interest in specific products on retail shelves.

Reduction in parking time, Ability to handle maximum vehicle in parking system

## Product Experience

Focus in depth on how the customer feels for our product/service concept. We mention every kind of experience we would want our user to feel, enjoy or avail. Also we make a list of all user problems we want to address and how user feels about their problems.

## **Product Functions**

Product functions deliver the product experience. We convert the product experience into functions for our product/service. What functions our product should perform to meet the customer experience we have just identified in product experience? Mostly the user experience/needs will be our product functions. e.g. if you want your users to feel comfortable & maintain right body posture while sitting on a chair, function provided must be comfortable sitting and healthy posture. If you are developing software, user requirement for faster experience would mean that faster working will be a function of your product. Same for a home delivery service.

## **Product features/ key components**

Features power the product functions. We find product features that will deliver the product functions we have identified. For a comfortable chair, ergonomic design would be one feature; footrest or armrest could be more. And how about a mobile or a cup holder? Multiple product features could lead to the same function. Features could also be components. Like arm-rest, neck rest or footrest. A faster algorithm could be a feature powering the speed performance of software.

## **Product Experience**

We focus on what the customers feels about a product and find out their problems. Jot down their key experience points, their wish list and the improvements sought.

## **Customer Revalidation**

We check to see if the functions and features we have built solve their problems.



## Reject/Retain/Redesign

As per the feedback received from users/stakeholders, students' teams need to modify their design and further action plan. In case the whole thing needs to be relooked it has to be iterated with new prospective.

Retain what users like, reject what they don't want & redesign what can be improved to meet the user challenges. Run the Reject/redesign/retain on the functions first and then if required on individual features to find how well they are powering the functions of your product/service.