GUJARAT TECHNOLOGICAL UNIVERSITY

Chandkheda, Ahmedabad

L.D College of Engineering

A

Project

Report On

AIR POLLUTION

Under subject of

DESIGN ENGINEERING – I

Submitted by:

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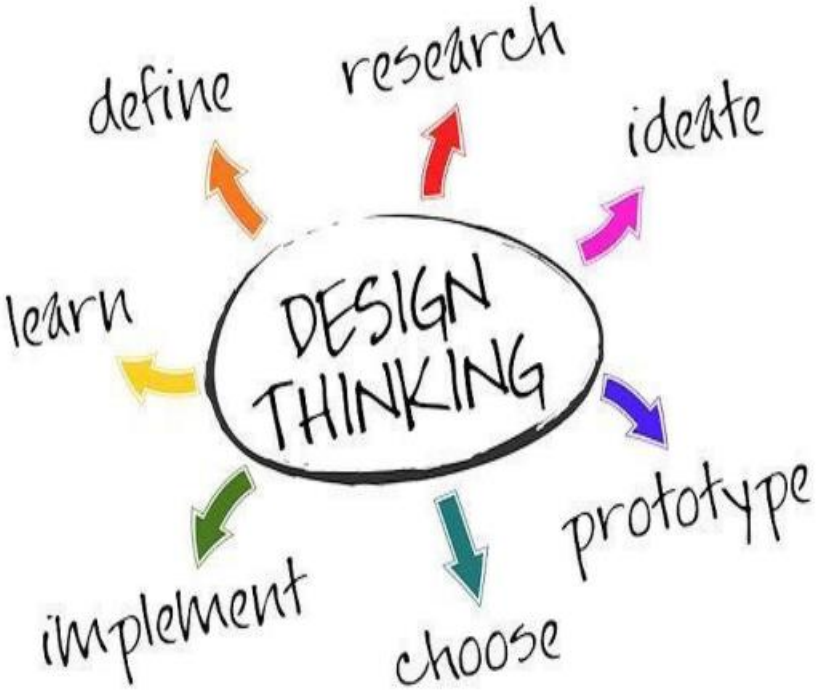
Chapter – 1 INTRODUCTION

1.1 Design Thinking:

What is Design Thinking? Your understanding…

Design Engineering is the best example of critical thinking and solving problem by developing a product therefore to solve it. Suppose it you see a problem, and being a human or rather an Indian we use to complain about it, but we don't think of solving it.

- A cognitive problem-solving process
- Origins = Edison and other inventors
- Encourages creative consideration of a wide array of innovative solutions.
- Can be applied to any field, including higher education.
- Approaches challenges from the point of view of the end user.
- Calls for a deep understanding of that user's unmet needs.
- A skill that allows a Designer to align
- what people want with what can be done, and produce a viable business strategy that creates customer value and market opportunity



The given diagram defines the steps to detect the problem and solution of the problem by Design Thinking.

In Design Thinking We believe that rather waiting for Moses (Genius) to come and showed us Innovation shouldn't we try something new! With Design Thinking, we can build the bridges to cross over the other side to the new land of promised future, so we can reliably manufacture our own Miracles.

- ❖ Innovation is iterative and the outcome of a series of experiments
- ❖ Effective innovation involves risk-taking, assessment and mitigation
- ❖ Innovation begins with creativity
- ❖ Innovation is smooth linear process
- ❖ Innovation is about risk-taking
- ❖ Innovation begins with Curiosity
- ❖ Encourages creative consideration of a wide array of innovative solutions.
- ❖ Can be applied to any field, including higher education
- ❖ Approaches challenges from the Point of View (POV) of the end user.
- ❖ Calls for a deep understanding of that user's emotional needs

1.2 Importance & Socio-Economical relevance

Design Thinking in this paper will examine how design disciplines relate to the social sectors and what are the distinctive values that design as a methodology can offer to tackle social challenges. The great attentiveness from business leaders and social innovators towards design as a source for creative methodologies and ways to gain valuable knowledge has elevated the discipline to management and strategy levels. As a result, creative approaches have successfully migrated from the design disciplines towards the business sectors. However, design thinking still needs to overcome the apparent complexity of social organizations. The inherent futuristic and descriptive nature of design and its methodologies provide valuable insights and efficient ways of doing things that are not well understood by the members of the social sector. This paper will look at how the discipline of design has evolved in the last fifty years and how new articulations of its methodologies and techniques can be applied to the achievement of social change. This paper will conduct a thorough analysis of the concepts of design thinking in order to unveil the historic evolution of this approach and enable this research to forecast future applications and realize recommendations to improve and foster its implementation. This investigation will be backed up with interviews with experts in the industry to engage in a dynamic debate that will define the reasons and

Casualties of why design methodologies are such a potentially compelling fit to meet the requirements of the social sectors

Nowadays in Design Framework there is not a unique definition that analyses the origins of design thinking and the shift in description of design. The coexistence of several form an ‘object-cantered’ discipline into the study valid and valuable interpretations of its nature, as of the principles and practices behind the design Fraser (2006) puts it, only shows how diverse and process leveraged into a problem-solving activity. Sometimes contradictory the perception of the design activity is. In this part we will Design from objects to an approach Traditionally Design has dealt with objects, thus the “immersed in this material culture, and draw design theory has revolved around them for most

upon it as their primary source of their think- of its existence despite the intentions of theorizing. Designers have the ability both to ‘read’ to shift away from them for the last twenty years. And ‘write’ in this culture; they understand Flusser (1999) for example, States from which design begins, what messages objects communicate before any activity or physical form take place. They can create new objects which embody takes the Search to discover opportunities beyond new messages” (Cross 2006). The materialistic level emphasizing the etymological origin of the words as the basis of any discipline.

1.3 Learning Tools and its importance

Design thinking incorporates constituent or consumer insights in depth and rapid prototyping, all aimed at getting beyond the assumptions that block effective solutions. Design thinking—inherently optimistic, constructive, and experiential— addresses the needs of the people who will consume a product or service and the infrastructure that enables it. Businesses are embracing design thinking because it helps them be more into market faster. Non-profits are beginning to use design thinking as well to develop better solutions to social problems. Design thinking crosses the traditional boundaries between public, for-profit, and non-profit sectors. By working closely with the clients and consumers, design thinking allows high-impact solutions to bubble up from below rather than being imposed from the top.

1.4 Team building and Log book exercises and importance

Team building is the collective term for various types of activities used to enhance social relations and define roles within teams. These often involve collaborative tasks. Many team building exercises are intended to find and address interpersonal problems within the group.

Over time, this activity developed to address the best practices for accomplishing tasks in a team-based environment It is distinct from team training, which is designed to improve the efficiency of the process, rather than the interpersonal aspect of it.

Team building is in the category of the theory and practice of organizational development. It can, however, be applied to a multitude of cooperative groups, such as sports teams, school classes, divisions of armies, or flight crews. The formal definition of team-building includes the following pillars:

- ❖ Goal setting: Aligning around goals
- ❖ Interpersonal-relationship management: Building effective working relationships
- ❖ Role clarification: Reducing team members' role ambiguity
- ❖ Problem solving: Finding solutions to team problems

According to Klein et al. (2009), team building is one of the most widely used group development activities in organizations today. Of all organizational activities, teamdevelopment was found to have the strongest effect out of various financial measures for improving organizational performance. Recent meta-analyses show that team development activities, including team building and team training, improve both a team's objective performance and supervisory subjective ratings of said performance.

Type of Team Formation

- ❖ You (Faculty) pick teams
- ❖ They (Student) pick teams
- ❖ Completely random selection
- ❖ A hybrid

➢Random Selection:

- ▪ It is quick selection will not take time.
- ▪ When to do Random Selection?
- ▪ Project is Less Thoughtful
- ▪ For short term discussion
- ▪ Methods to do Random(arbitrary) selection
- ▪ Write name in chit and through in bowl then pick up the chit
- ▪ Same letter for starting of their name
- ▪ By enrolment number
- ▪ Cards or number allocation

What happens when students select team?

One student just pretends to do work but does not. Other one disappears day oneitself and comes on final day.

Ultimately only one person does the drill.

What happens when faculty selects team?

Faculty does not know how that people are synced with each other. They don't know in which areas they live. They generally decide by consecutive roll call.

This in a way is very hazardous.

How to form hybrid team?

- ❖ Find quality of student
- ❖ Form an intermediate group
- ❖ Ask student to make their final Team

Qualities to be searched

- ❖ Project Organizer (who manages the entire project)
- ❖ An analyser (who can do analysis of data)
- ❖ Stream wise technical Skill person (Mechanical, Electronics, Software and etc.)
- ❖ Concept Ideator (Person who visualizes the Idea a solution for the problem)

Requirement of TEAM Formation

- ❖ Teach each other
- ❖ Practice communication, teamwork, project management skills
- ❖ Work on higher-order assignments
- ❖ Expand network & meet new people
- ❖ Learn readings better (discussion groups)
- ❖ Simulate real-life work environment

Why to keep a log book?

❖ An engineering logbook is a personal/professional reference about project learning and results.
❖ These records may become necessary to provide a history of the design if there is a turnover in staff, if patent applications are made, or in the case of legal action where the demonstration of professional practices is necessary.
❖ Monitor and control where you invest your time,
❖ Learn and apply the best practices for your profession
❖ Regularly take time to learn from successes and failures

Log book Specifications

❖ Think of the logbook as a design diary.
❖ Contain all sketches, notes and decisions pertaining to the design.
❖ Bound notebook so pages can't be removed
❖ Write in ink. Don't erase.
❖ Date every page
❖ Fill consecutive pages
❖ Keep up to date
❖ Include everything you contribute to ... good, bad, and ugly

Contents of a log book

❖ Sketches/doodling
❖ Customer needs or requirements
❖ Class notes
❖ Project objectives
❖ Meeting notes
❖ Action Items
❖ Half-baked Ideas
❖ Math calculations

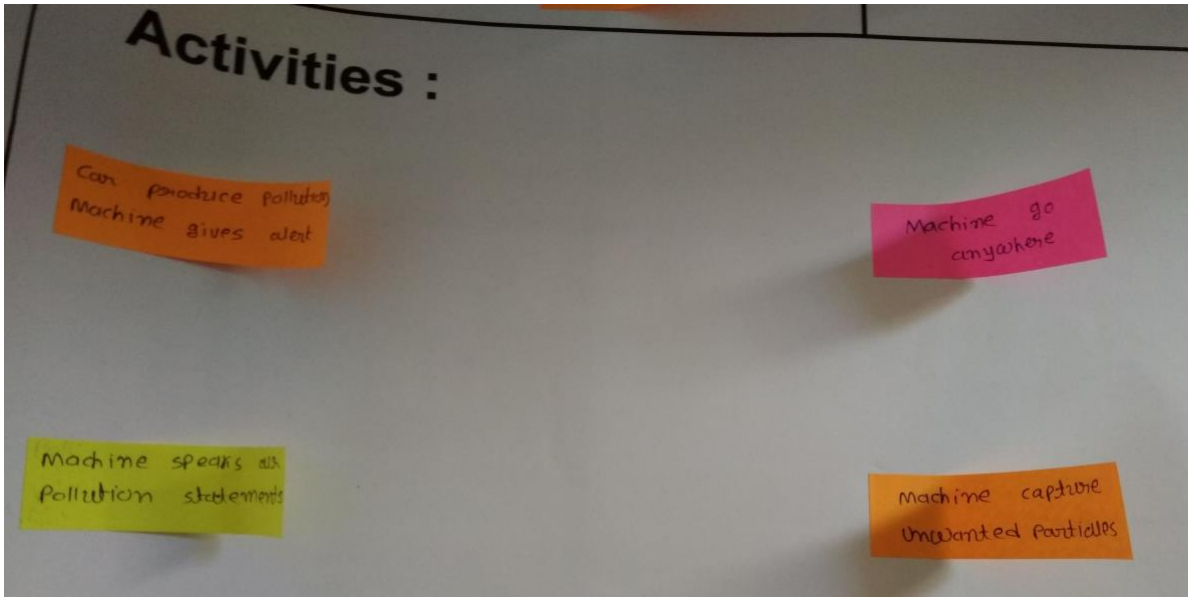
- Work-in-progress
- Design alternatives
- Vendor notes
- Research findings
- Sources of ideas
- Evaluation of data/results
- Design reviews
- Decision criteria
- Design process
- Rational for decisions
- Project reflections
- Professional development

Chapter – 2 Empathy Mapping

Empathy Mapping:

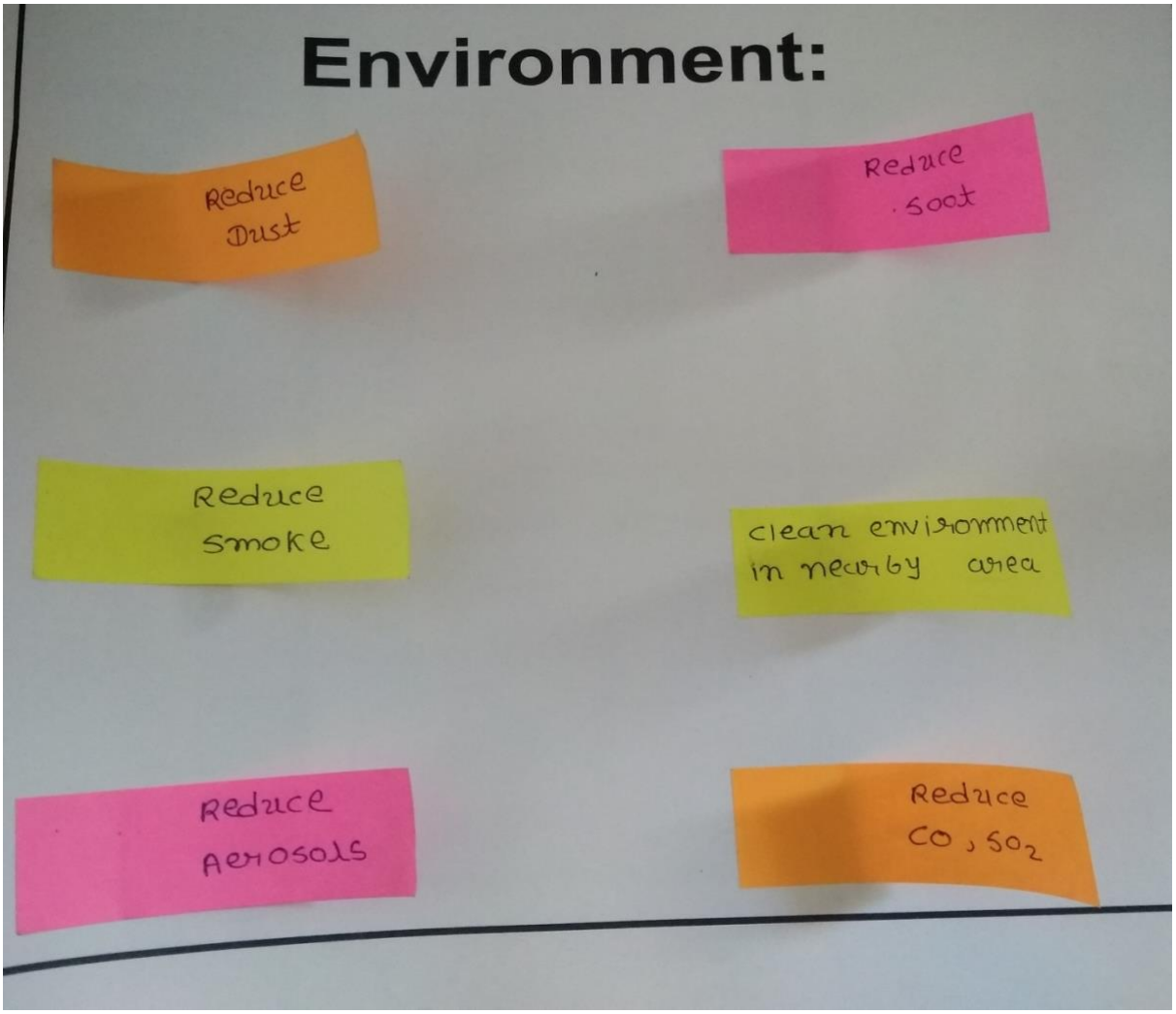
Observation through AEIOU methods and other

1.Activities:



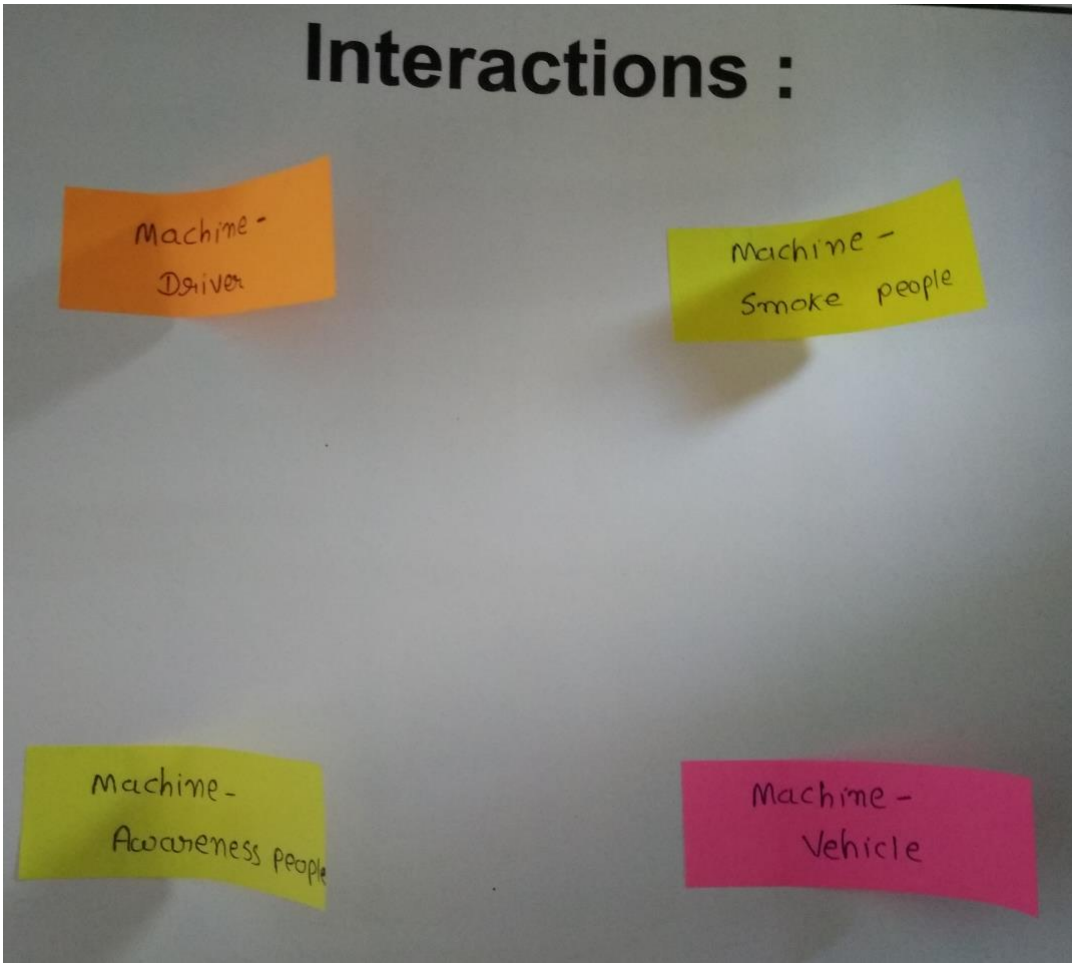
- Machine go anywhere
- Machine speaks air pollution statement
- Machine capture unwanted particles
- Car produce pollution machine gives alert

2.ENVIRONMENTS:


Environment:
Reduce Dust
Reduce Soot
Reduce Smoke
clean environment in nearby area
Reduce Aerosols
Reduce CO, SO_2

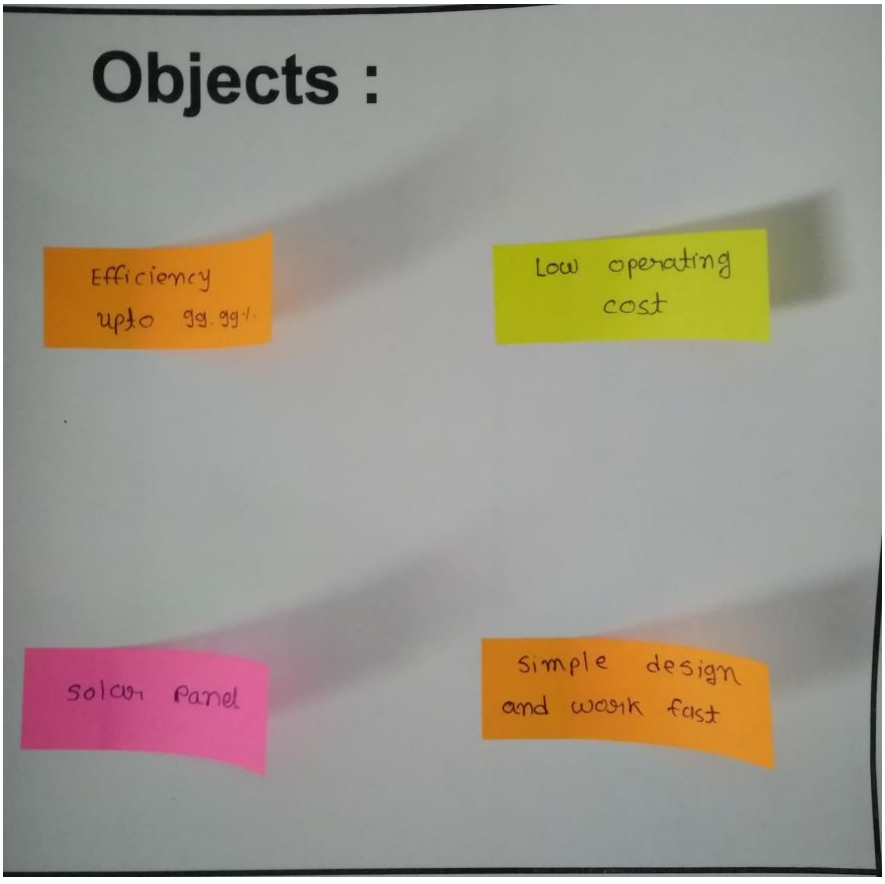
- Reduce dust
- Reduce soot
- Reduce smoke
- Reduce co,so2
- Reduce aerosols
- Clean environment in nearby area

3.Interactions



- Machine to driver
- Machine to awareness people
- Machine to vehicle
- Machine to smoking people

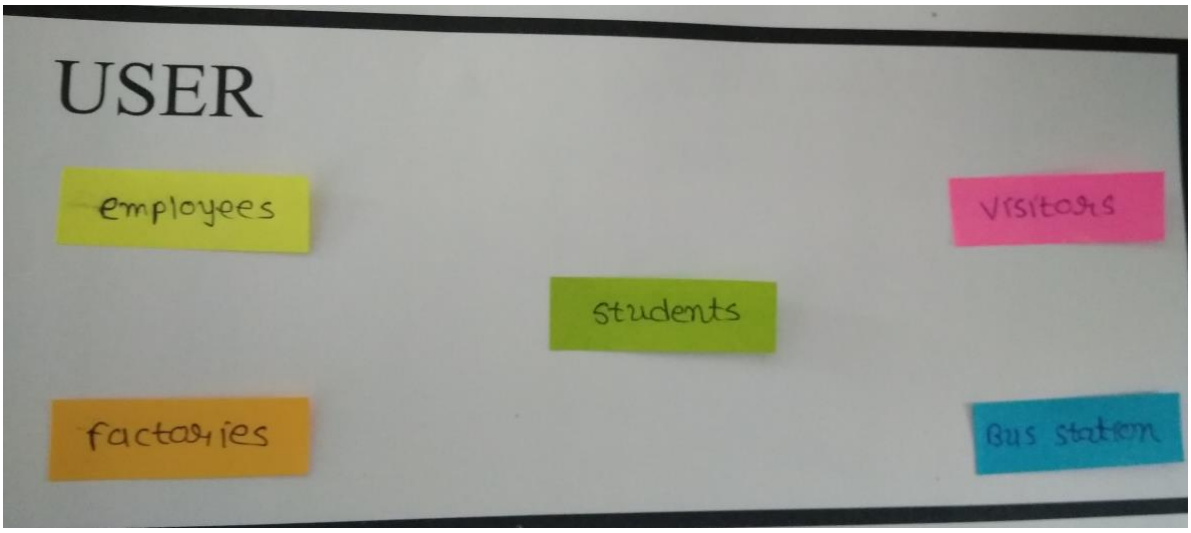
4.objects:



- Solar panel

- Low operating cost
- Simple design and work fast
- Efficiency upto 99.99%

5.USERS:



- Employees
- Students

- Visitors
- Bus station
- Railway station

b) Mind Mapping (Data analysis):

"A mind map is a visual representation of hierarchical information that includes a central idea surrounded by connected branches of associated topics"

BENEFITS:

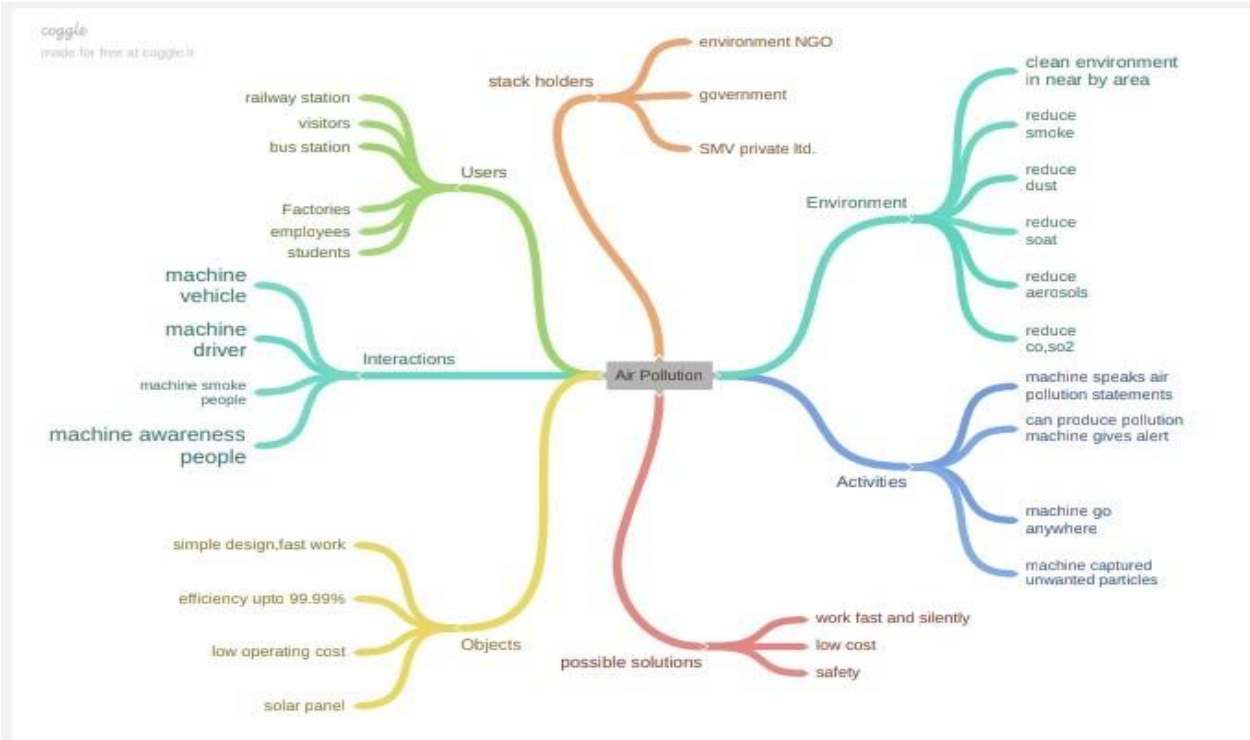
-Helps brainstorm and explore any idea, concept, or problem

-Facilitate better understanding of relationships and connections between ideas and concepts

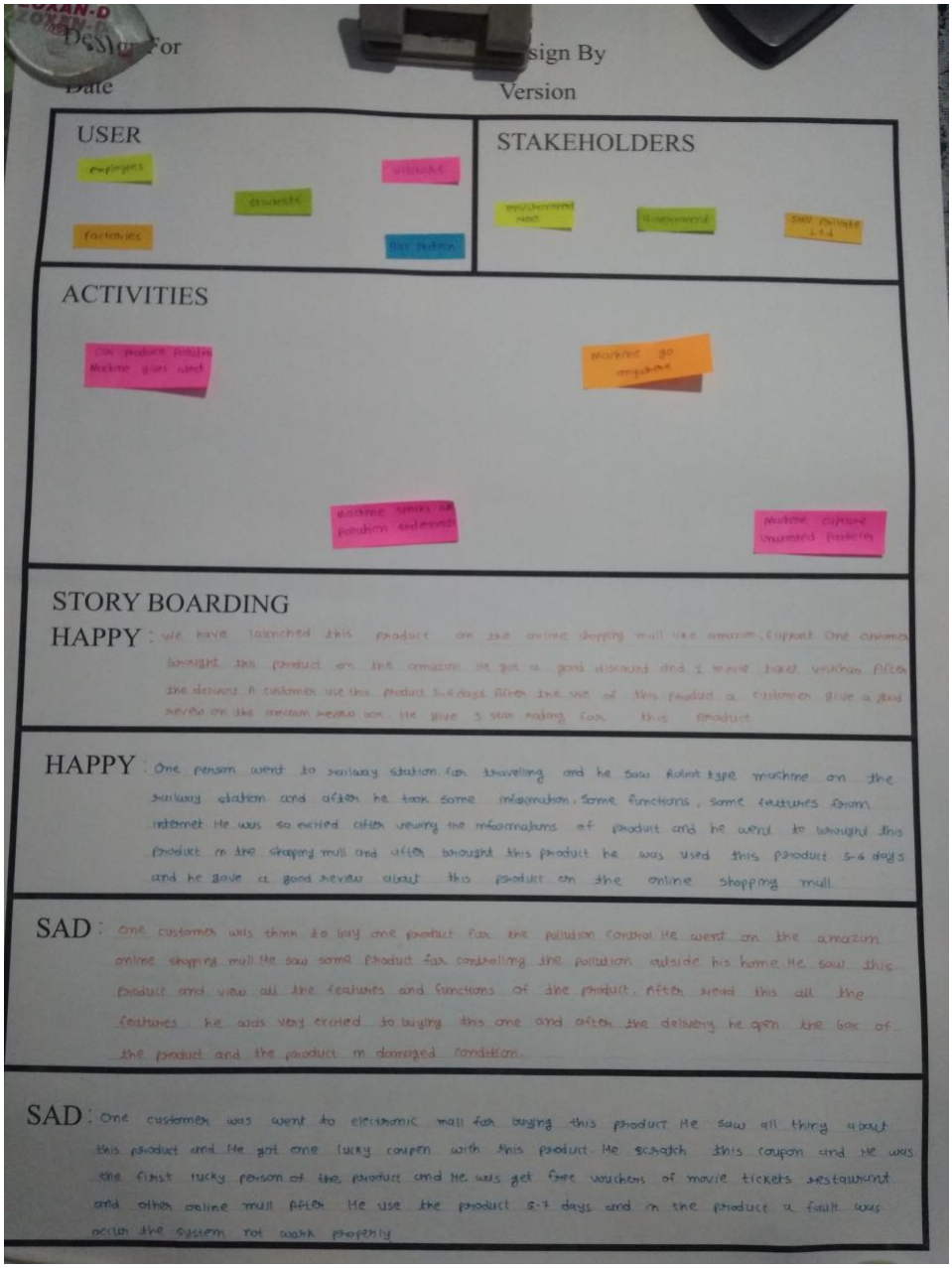
-Make it easy to communicate new ideas and thought processes - Allow students to easily recall information

-Help students take notes and plan tasks

-Make it easy to organize ideas and concept.



c) Empathy Mapping Canvas:



USER:

- Employee
- Students
- Visitors
- Bus station
- Railway station

STAKEHOLDERS

- Environment NGO
- Government
- SMV private LTD

ACTIVITIES:

- Machine go anywhere
- Car produce pollution machine gives alert
- Machine speaks air pollution statements
- Machine capture unwanted particles

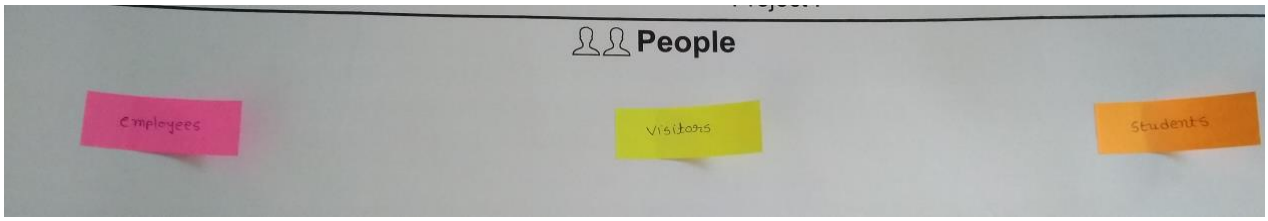
STORY BOARDING:

1. happy story
2. sad story

Chapter – 3 Ideation Canvas

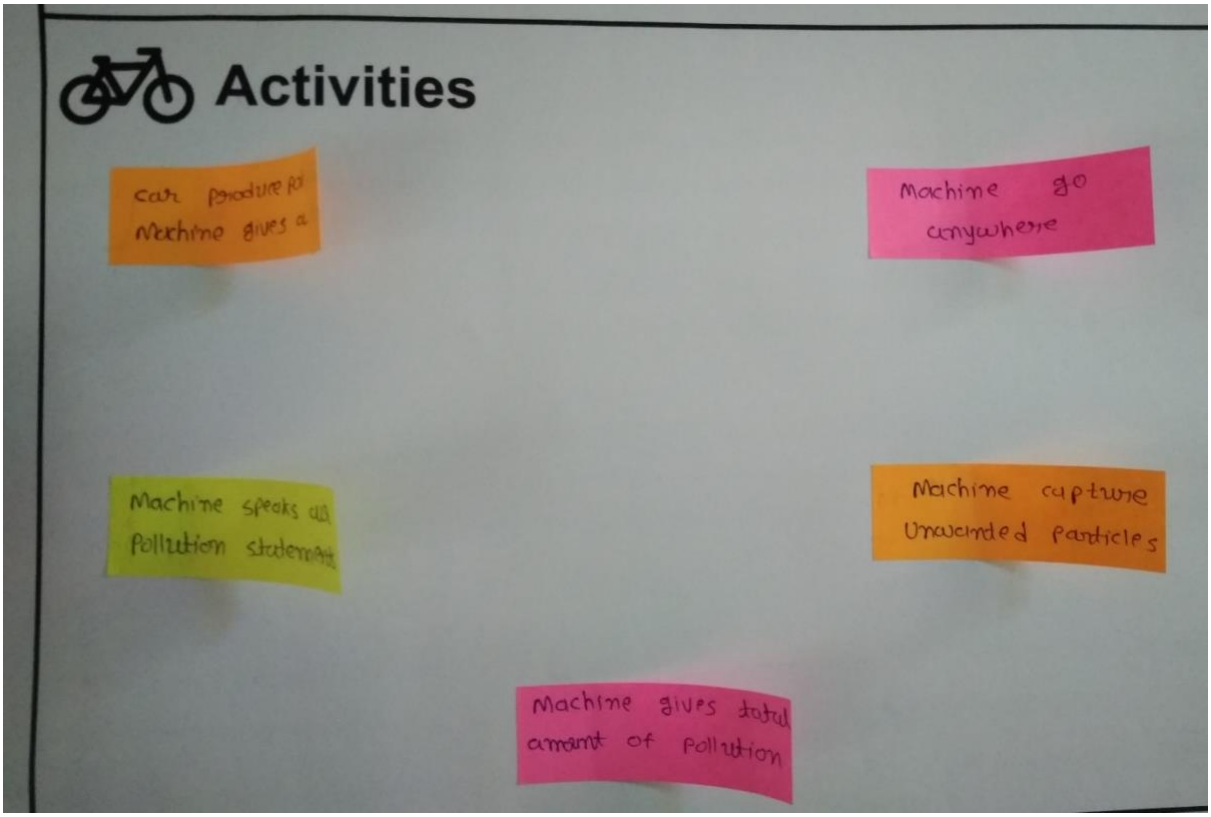
Ideation Canvas:

1.People:



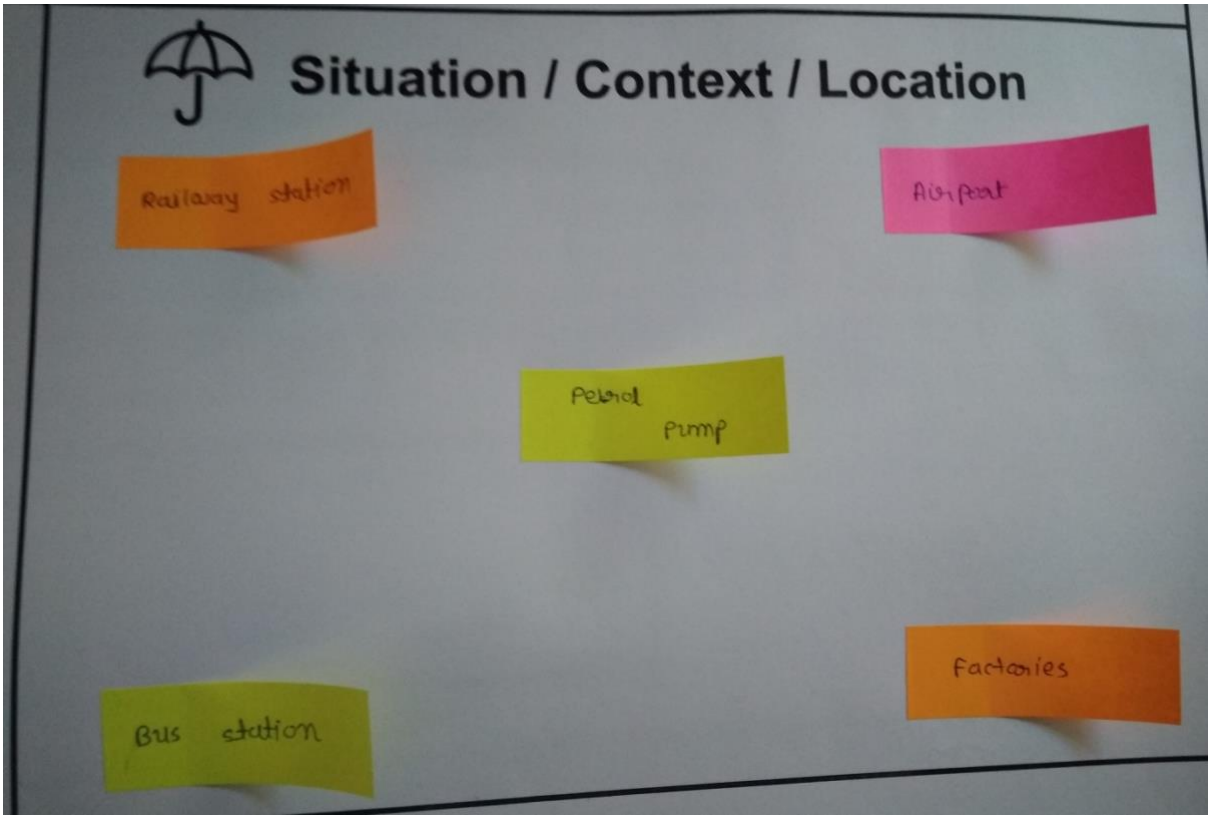
- Employees
- Visitors
- Students

2.Activities:



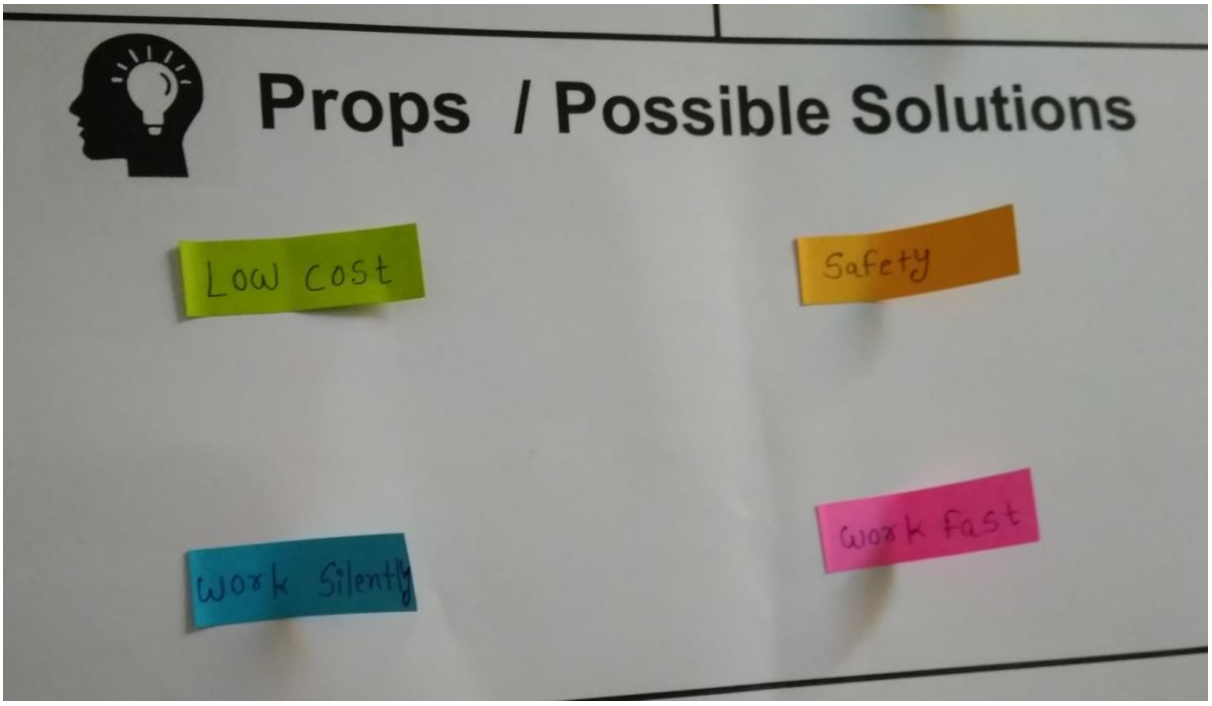
- Car produce pollution machine gives alert
- Machine show total amount of pollution
- Machine go anywhere
- Machine speaks air pollution statement
- Machine capture unwanted particles

Situation/Context/Location:



- Bus station
- Airport
- Railway station
- Factories
- Petrol pump

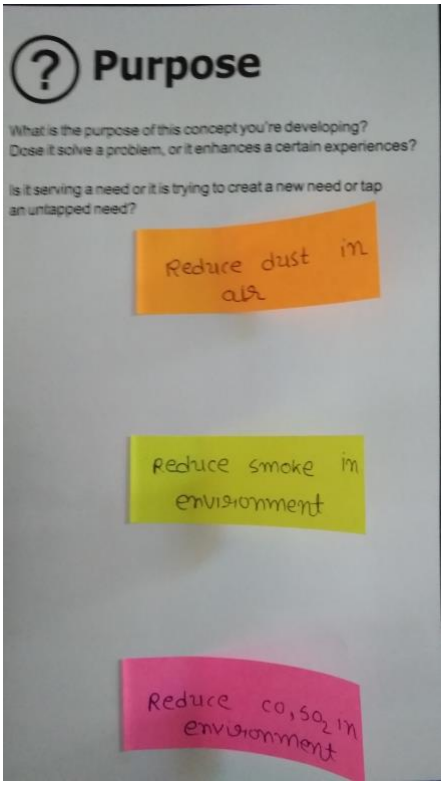
4.Props/Possible Solution:



- **Work fast**
- **Work silently**
- **Safety**
- **Low cost**

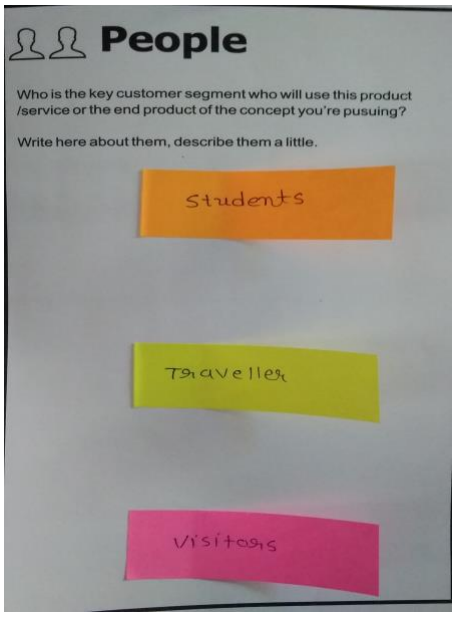
Chapter – 4 Product Development Canvas

Purpose



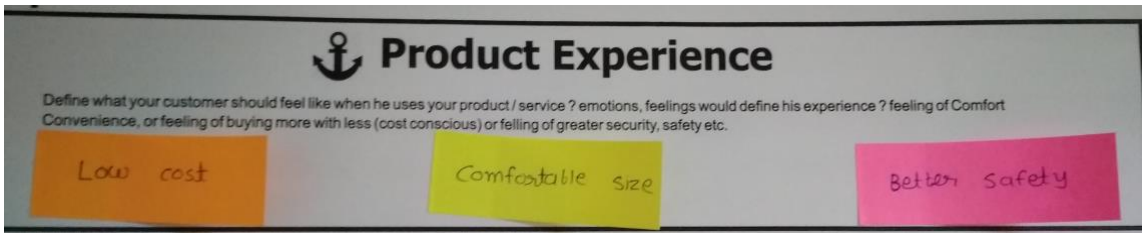
- Reduce dust in air
- Reduce smoke in environment
- Reduce co , so2 in environment

PEOPLE



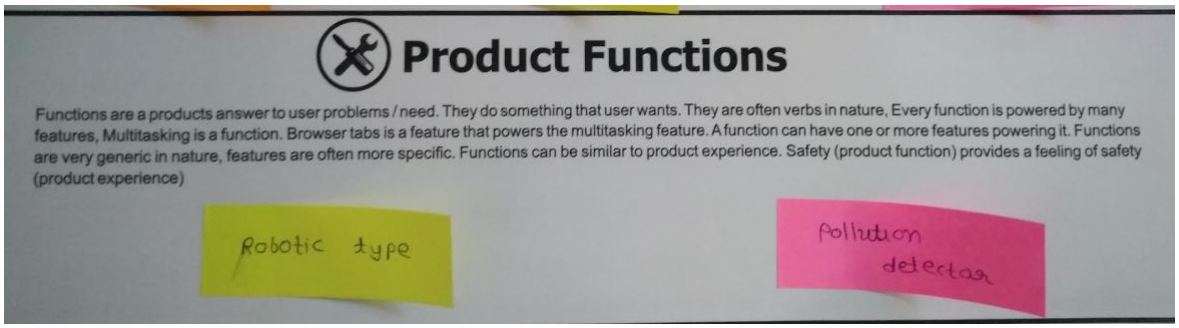
- Driver
- Conductor
- Student
- Worker
- Higher Authority

PRODUCT EXPERINCE



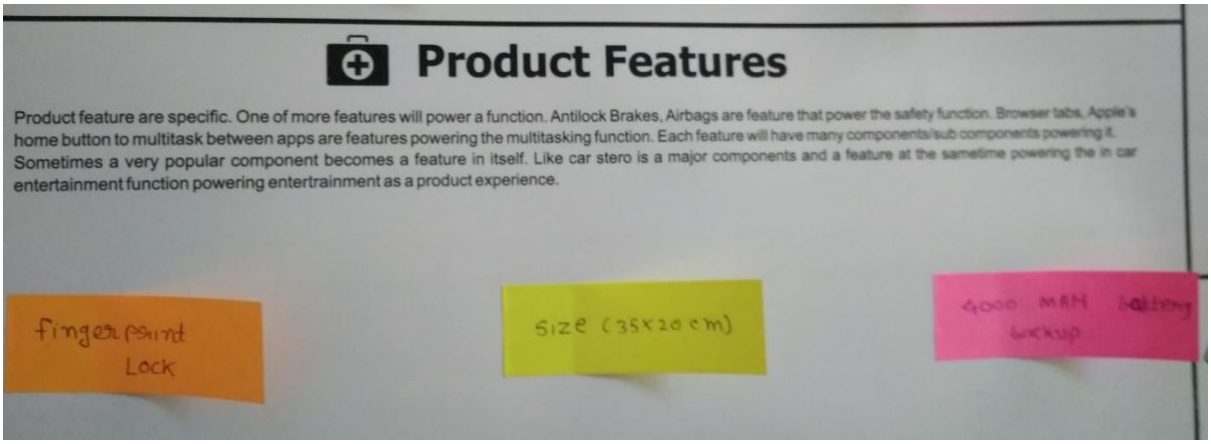
- Low cost
- Comfortable size
- Better safety

PRODUCT FUNCTIONS



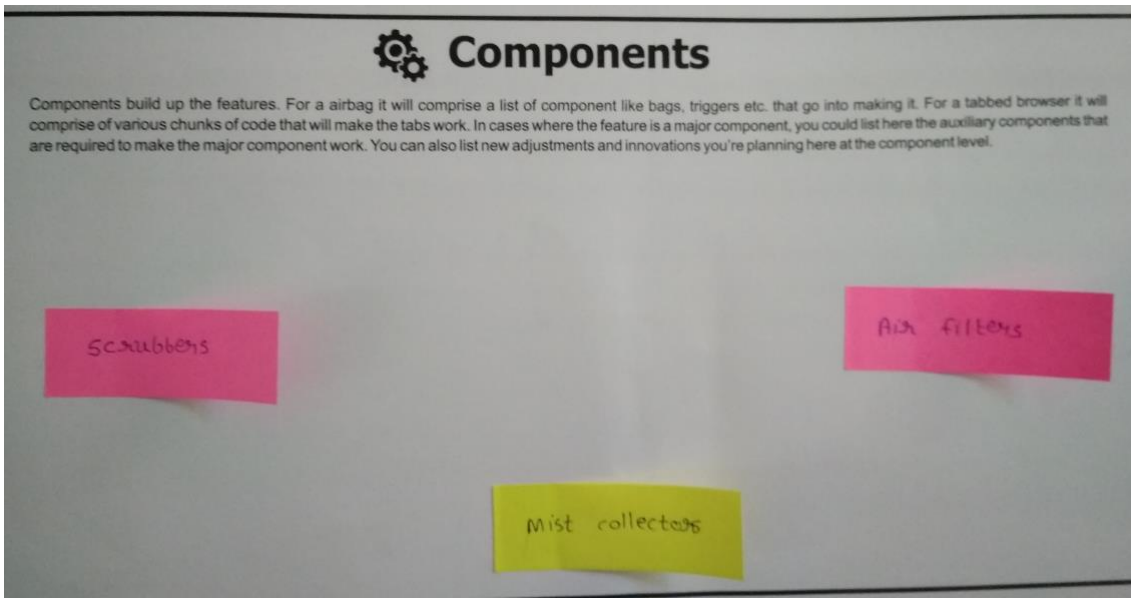
- Robotic type
- Pollution detector

PRODUCT FEATURES



- Finger print lock
- Size (35 * 20)cm
- 4000 MAH battery backup

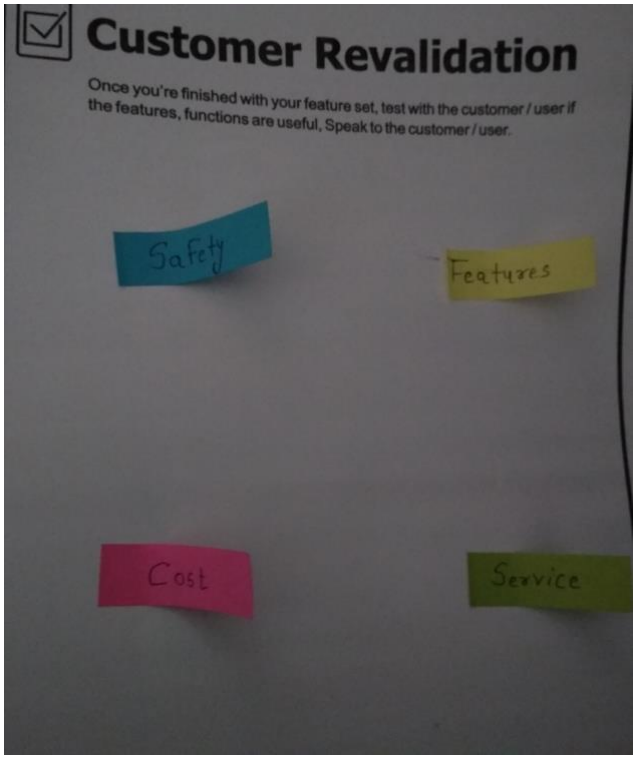
COMPONENTS



- Mist collectors

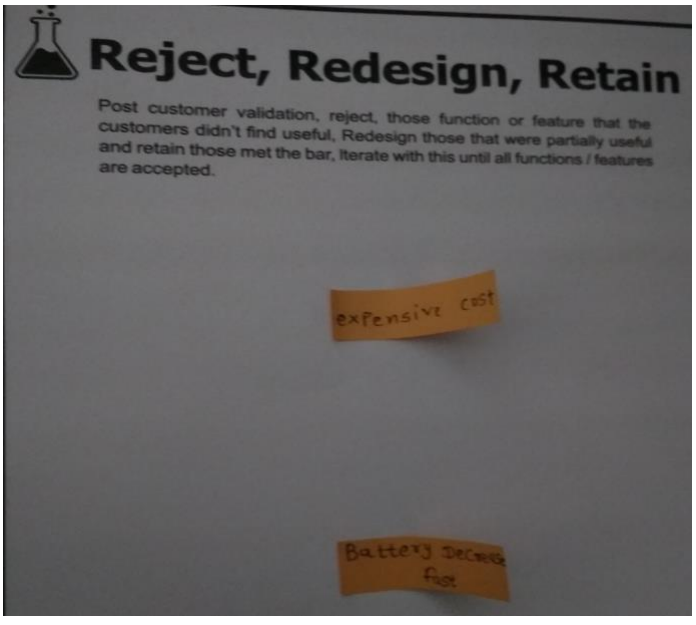
- Scrubbers
- Air filters

Customer Revalidation



- Cost
- Safety
- Service
- Features

REJECT,REDESIGN,RETAIN



- Expensive cost
- Battery decrease fast

Chapter – 5 Conclusion

In this project most probably target point is air pollution issues because today's time lots of Indian public are traveling bus and rail-ways

Most of public is very annoying for this air pollution so we are decide to work on this project

In this project we have make one machine for controlling and reducing the pollution

So the function of the machine :

- Work fast
- Work silently
- Low cost
- Safety
- Contact with awareness people