



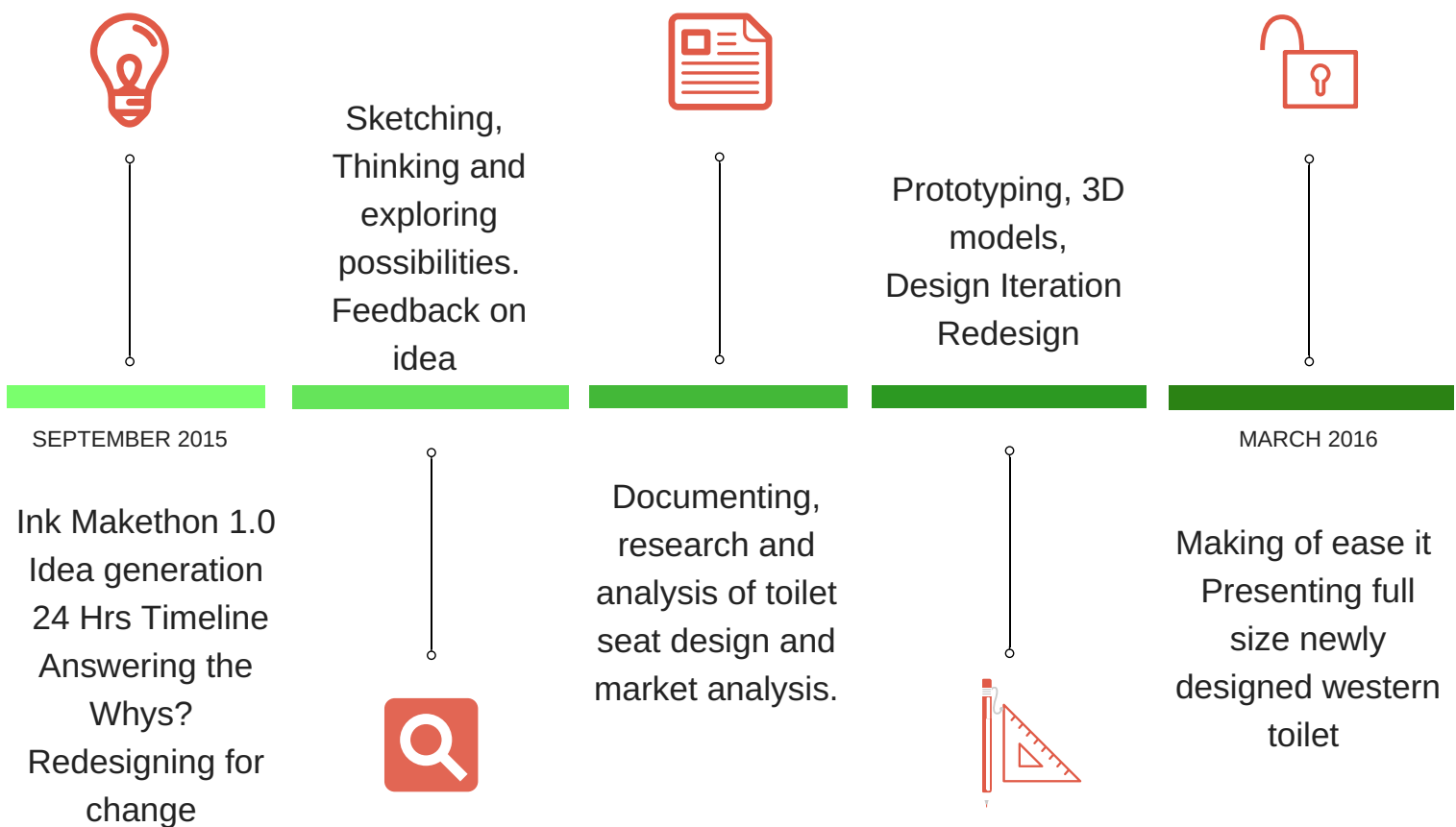
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**To redesign western toilet seat
considering the human posture
and the health issues with the
existing designs.**

A LOOK INTO TIMELINE





P R O B L E M

INDIAN TOILET

This method of excreting has been there as long as man has. Over the years aesthetics might have changed but humans are meant to squat down to excrete.

People with knee and joint pain and even a fit person finds it difficult to squat for long periods.



WESTERN TOILET

Approximately 150 years ago, the western seat came as a symbol of luxury into the society and is now a common-place object.

It was accepted because it's easier and more comfortable than the squatting position in the Indian toilet.

But this is unhealthy for us.



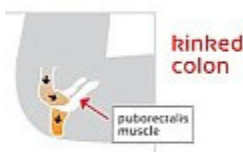
Our ancestors squatted for centuries before the invention of the modern day toilet



The colon has main purpose of removing the waste from our body
It features a natural bend (anorectal angle) that aids the continence



B I O L O G Y

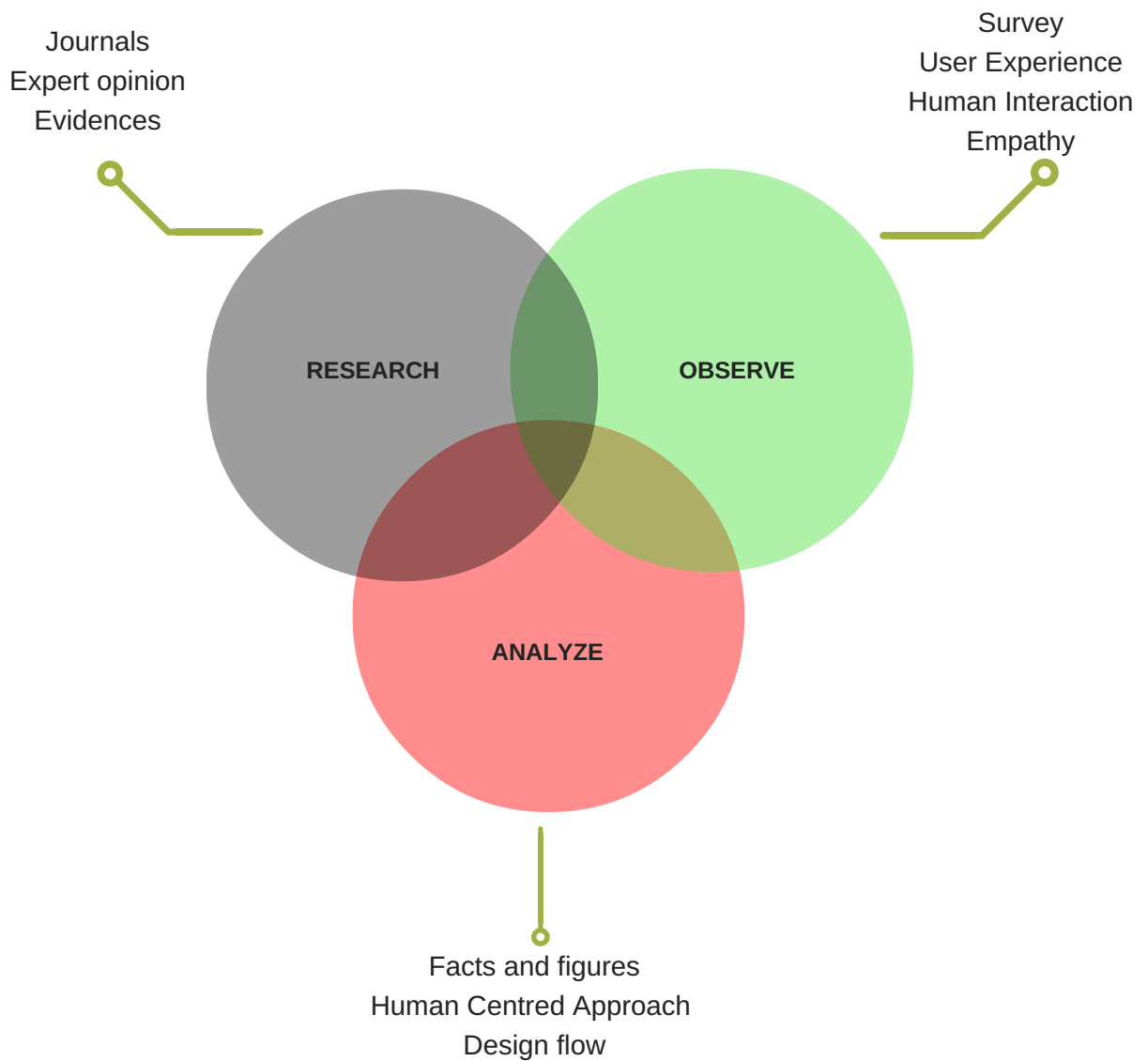


The puborectails maintains the anorectal angle. Sitting only partially relaxes, the muscle, meaning that the muscle is still kinked.

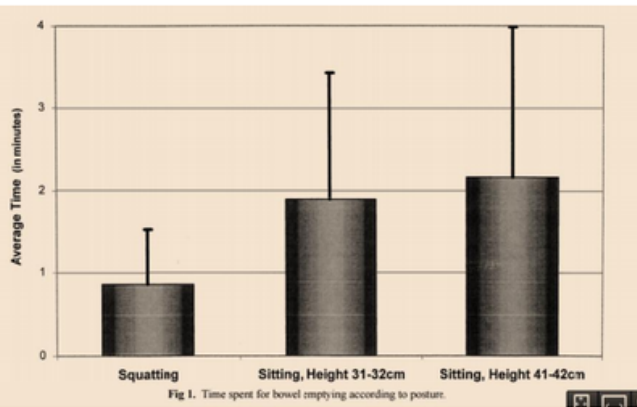


When squatting the puborectails lossens creating a straight passageway into the rectum

FLOW MODEL



RESEARCH FINDINGS



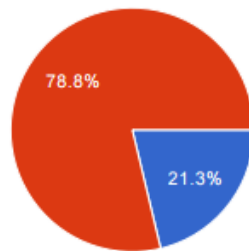
Three positions on defecation and video imaging. A typical recording of a subject(case 1) is shown. Left column shows body positions(a, sitting; b, sitting with the hip flexed; c, squatting with the hip most flexed). Right column indicates the anorectal angle on defecation according to the body position in the left column. The anorectal angle was measured radiographically in a lateral view using two central longitudinal axes of the rectum and the anal canal, respectively, which lie in the centre of two wall lines. The anorectal angle on defecation became larger with squatting (c, f) than with sitting (a, d), and also larger than with sitting with the hip flexed (b, e). Pressure values are not indicated here.



The aim of the study, conducted by Dov Sikirov (MD), was to compare the straining forces applied when sitting or squatting during defecation. Twenty-eight apparently healthy volunteers (ages 17–66 years) with normal bowel function were asked to use a digital timer to record the net time needed for sensation of satisfactory emptying while defecating in three alternative positions: sitting on a standard-sized toilet seat (41–42 cm high), sitting on a lower toilet seat (31–32 cm high), and squatting. They were also asked to note their subjective impression of the intensity of the defecation effort. Six consecutive bowel movements were noted. In conclusion, the study confirmed that sensation of satisfactory bowel emptying in sitting defecation posture necessitates excessive effort compared to the squatting posture.

SURVEY

Which toilet seat do you have at home?



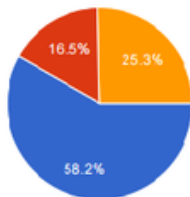
Indian	17	21.3%
Western	63	78.8%

Survey - User Opinion

No of responses - 80 including men and woman
Keys insights from survey

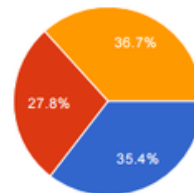
- % use of western toilet was higher compared to Indian
- Lack of awareness about the problem
- Willingness to change for better health and future after understanding the issue with the existing models .

Are you willing to change your toilet seat if it improves your health?



Yes	46	58.2%
No	13	16.5%
Depends on the cost	20	25.3%

Are you aware about problems caused due to anorectal angle not maintained in the western toilet?

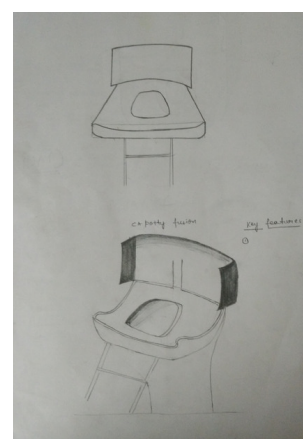
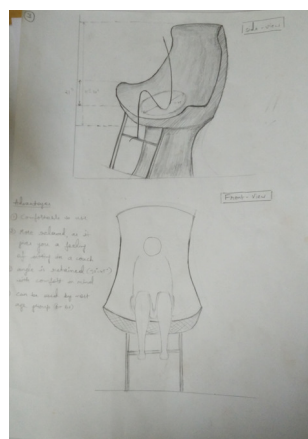


Yes	28	35.4%
No	22	27.8%
Don't understand anorectal angle	29	36.7%

DESIGN FLOW

IDEATION
SKETCHING
DESIGN CONCEPTS
MODELLING
ITERATION
3D- PROTOTYPING

Sketching different possibilities to arrive at the concept

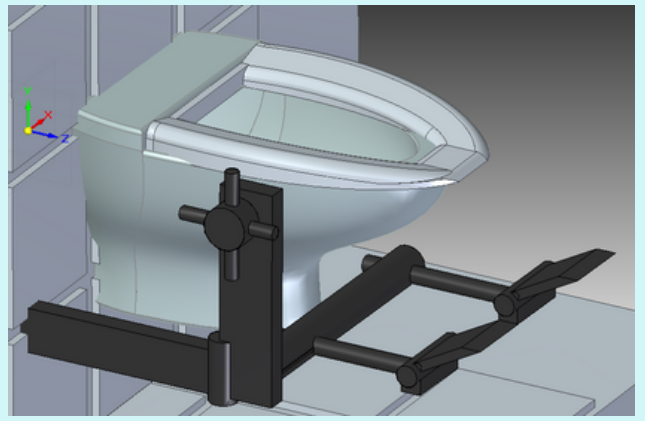
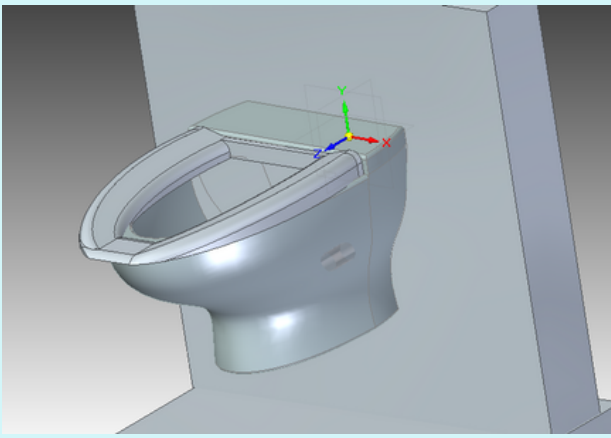


Concepts

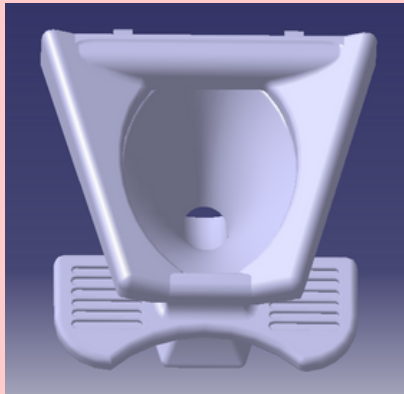
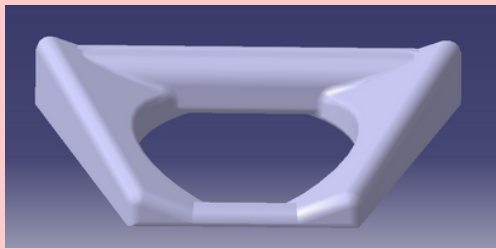
Design challenge - To get the squatting posture in the western toilet seat.
For mimicking the squatting posture of human it is required to redesign the existing design of the western toilet which includes two features

1. Change of seat structure for comfort
2. Footrest to rest the foot while attaining squat posture

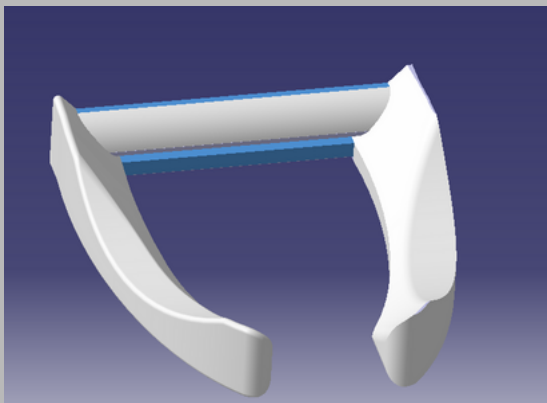
1



2



3



Slight inward inclination of seat with mechanical adjustable foot rest to attain comfortable posture; the black mechanical rotor allows individuals to adjust according to their height.

The seat is altered for better comfort with seat inclined 20 degree inwards. The foot rest is fixed to model

Softer edges on seat; sloppy rather than straight inclination. The foot rest is shifted towards side from previous design

P R O S A N D C O N S

1	-Mechanism is adjustable for different height -The system is not attached to the seat as a whole -Simple and easy to use
	-Hygiene concern when using the foot rest mechanism -Posture required is not completely maintained and chances of nearing to perfect angle is difficult
2	-This design makes human attain a good posture because of inclination. - Its comfortable and suitable for different age group
	- Design is not in shape with the most existing models; requires additional moulds for manufacturing. - Footrest is fixed to the seat, difficulty in using while defecating because of discomfort.
3	-The design retains the most commonly used cylindrical/round shape -The edges of the inclination is smoother than previous design;follows the shape of the lower body.
	- The back side of seat may cause pain when using the western toilet seat

DESIGN

After analysing the pro's and cons of the different 3D models and 3D printed models.

Design Features

- 1 . The seat requires the inward inclination at the sides as seen in the design model this overcomes hurting of thighs also allows human to attain angle near to squatting.
2. Footrest that will help feet rest on an elevated stool; flat stool doesn't help in mimicking the squat posture.



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