

Redesign of Gym Equipment (Home)

Suhrid palsule

Guide : Prof. U Athavankar

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- Why strength training
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- Ideation
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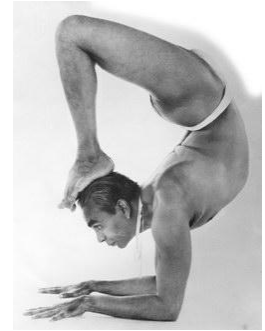
methodology

- Study and Understanding of
 - strength training and its benefits
 - Basic Anatomy, Musculature
 - Process of muscle building, training techniques, Nutrition and Metabolism
 - Bio-mechanics and Kinematics, types of strength training exercises, free weights vs. Machines
- Visited;
 - AIPT, Pro-Fitness Hub, Manufacturer
- Interviewed;
 - Dr. Paralikar, Head of Physiotherapy, DM Hospital, Pune.
 - Mr. Vikas, Gym Instructor and Fitness expert

Why strength training

What is strength training? Why?

- For muscle building
- Several advantages
- Less workout of the muscles. Human race used to more physical activity.
- Such products





- **Bench Press:**

Set-up - The lifter keeps their feet flat on the ground or at end of the bench, with the buttocks always in contact with the bench.

Technique - The movement begins by lifting the bar off the rack, and lowering it until the bar is motionless on the chest before being pressed under control to the start position.



Lateral pulldown & Leg Press



exercises



Shoulder press



Pec fly



Chin Ups



Dumbel shoulder press



Bench press



Leg curls



Hyper-extension



GYM



AIPT, Pune

- Space
- Cost
- Time
- Public place

Home-gyms



Home-gym - (2)

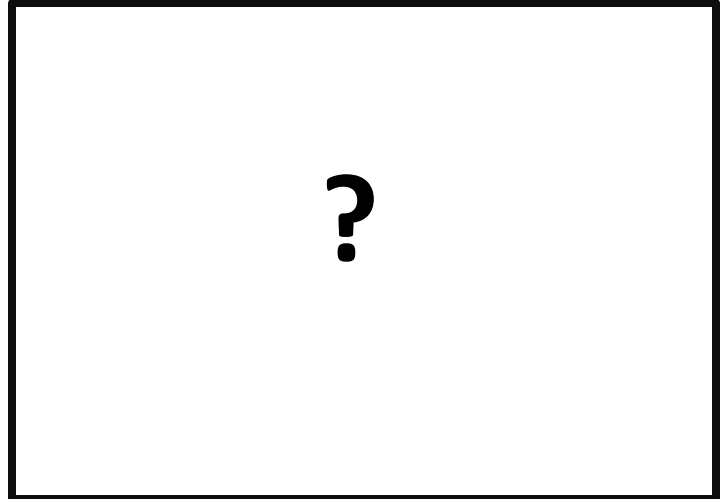


Home-gym - (3)




BOWFLEX





Problem definition

Problem brief

“To **design**
strength
training
equipment
for use in urban
homes”.

Functionality:

final product must not affect the way the exercises are performed.
no compromise in the number of exercises

Compactness:

Truly compact and comfortable for use even in a small apartment. should be capable of collapsing/ folding into a small volume

Build quality and Visual appeal:

Must be strong yet non-bulky and potent yet inviting.

Semantics:

Must successfully convey that it is a piece of fitness equipment but it should also blend into the home environment. Must look like a piece of Fitness equipment when in use and as a non-imposing household item, when not.

Cost:

Must be truly affordable and well under the price of current home gyms.

List of exercises

EXERCISES	MUSCLE GROUP	Popular Exercise Machines	Exercise recommended by instructor
UPPER BODY			
barbel shrug	trapezius		
standing military press			
machine shoulder press			
dumbell side raises			
barbell seated overhead press			
dumbell front raises			
dumbell rear raises			
bench press			
dumbell bench press			
incline bench press			
vertical chest press			
machine pec fly			
pull ups/ chin ups			
lat pulls			
bent over row			
one arm dumbell row			
seated cable row			
seated machine row			
dips			
assisted chin ups			
assisted dips			
close grip bench press			
tricep pressdown			
tricep extension			
dumbell bicep curl			
EZ bar curls			
hammer curls			
cable curls			
chinups			
barbell curls			
barbell upright row			
hyper extensions			

5.6 List of exercises

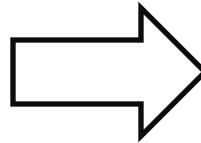
The following is the complete list of exercises and are classified according to the part of the body they work out. Also, the 1st column shows the range of exercises covered by all Home gym machines, together. And the second one shows the exercises that the product is intended to provide.

LEGS	
front squat	
back squat	
leg press	
dumbell front lunge	
dumbell reverse lunge	
dumbell side lunge	
dumbell step-up	
roman deadlift	
deadlift	
seated leg curl	
seated leg extensions	
seated hip abductions	
seated hip adduction	
standing calf raise	
leg press calf raise	
seated calf raise	
smith machine/ machine calf raise	
leg raises	
TORSO	
abdominal exercises	
machine ab-crunch	
stability ball crunch	
roll-out	
jackknife	
stability ball pushup	
machine ball overhead reach	
outside calf touch	
prone plank	

List of exercises (2)

EXERCISES	MUSCLE GROUPS	MOVEMENT INVOLVED	HUMAN BODY POSITION	HANDLE / EQUIPMENT	POSITION
Multi press	shoulder, arms, chest, upper back	vertical:	lying, inclined, upright seated	straight, partially curved. Spaced apart and located at shoulder width	shoulder height.
Lat pulley	trapezius, chest, upper back, arms	vertical:	upright, back bent slightly fwd	long handle bent at sides, cable connection	top: 7 ft.
Leg curls	hamstrings, calves	curved, inwards, pivoted at knee,	lying prone(face forward), or seated	2 roller sets, pivoted, cable connection	knee height
Leg extensions	quadriceps	curved, outwards, pivoted at knee	seated	2 roller sets, pivoted, cable connection	knee height
Seated row	lower back, lats, arms	horizontal	seated on bench, feet supported, back straight	handle, cable	hip height
Chin ups	trapezius, chest, upper back, arms	body swings vertically	holding only handles at > shoulder width, body hanging	long horizontal handle, fixed at sides	top: 7 ft.
Dips	triceps, lats,	body moves vertically up,	holding bars only, body hanging, upper arms parallel to ground	parallel bars	parallel bars, d height
Leg raises	lower abs, thighs, legs	lower body swings through 90 degrees	lower arms resting on horizontal pads, back supported, rest body hanging	padded parallel bars + vertical stump grips	parallel bars, d height
Tricep pressdown	triceps, chest	lower arms	standing, back slightly bent	small handle	independent handle
Leg press	legs(complete)	legs fold and open	seated on small seat, feet on pad		
Pec fly	pecs, shoulders	arms open and close	lying on back/ seated upright	angular handle, padded vertical members	shoulder height when lying on bench
Hyper extension	lower back, hams	torso swings from hip	lower body supported at angle, free from hip upwards	roller + inclined pad for thigh	

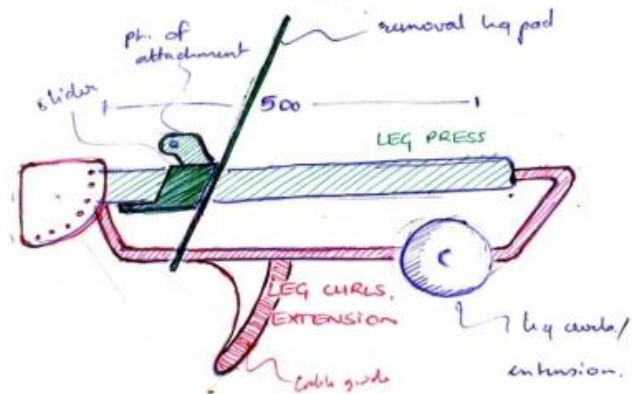
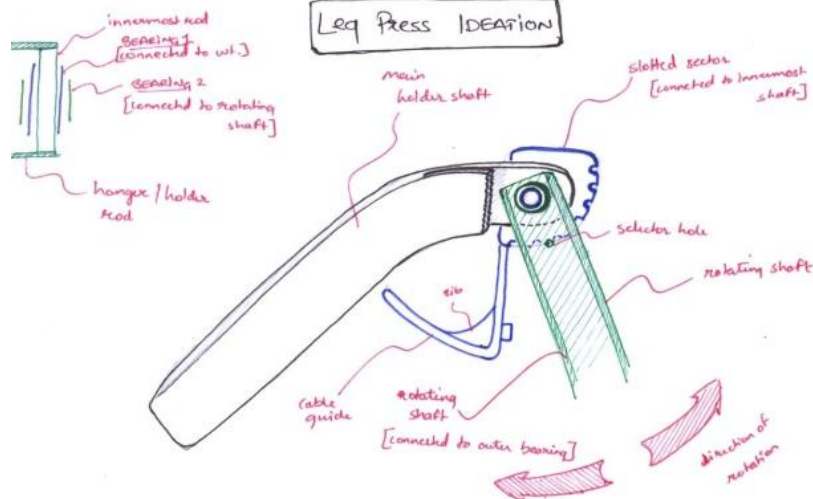
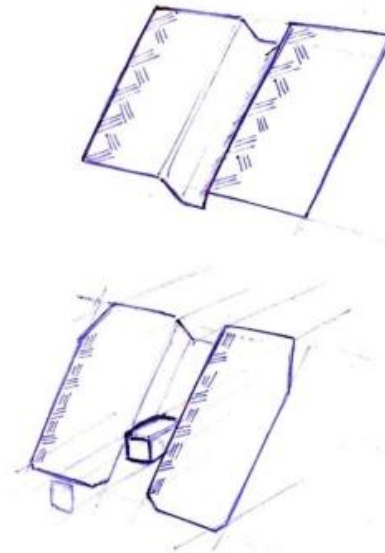
Visual analogy



Ideation

I d e a t i o n

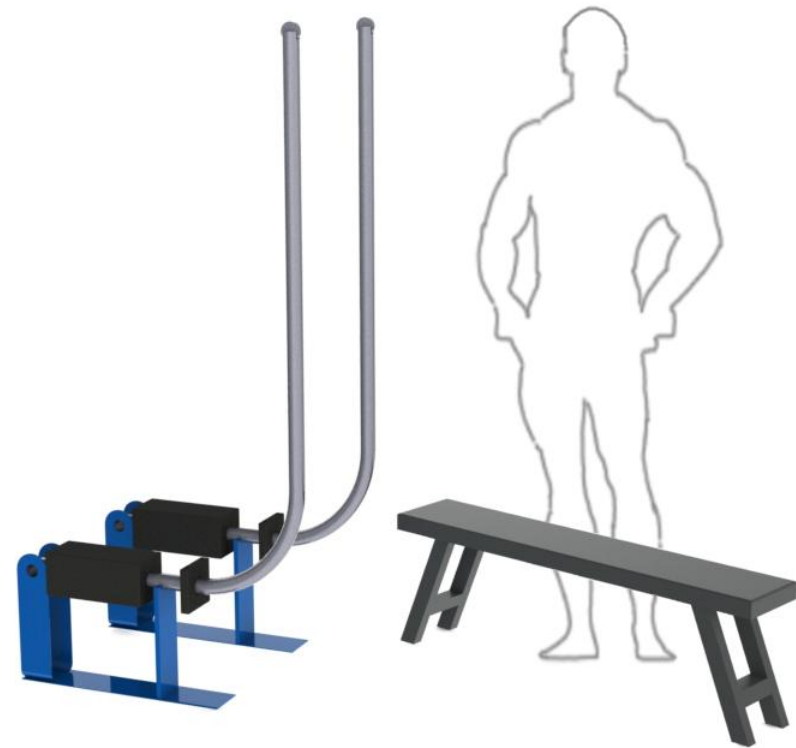
- Compaction, multi function
- Size and material reduction
- Packaging and form



Concept generation

Concept 1

- **Functionality:** Offers majority of the exercises(from those in the list).
- **Compactness:** is ultra compact.
- **Build quality and Visual appeal:** an improvement over most competition, but lacks elegance.
- **Cost:** The minimal material needed will ensure the price is a fraction of what other models cost.

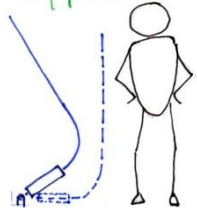


Concept 1: Exercises

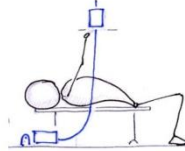
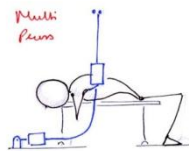
leg curls



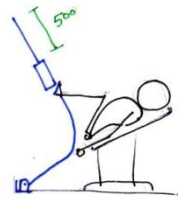
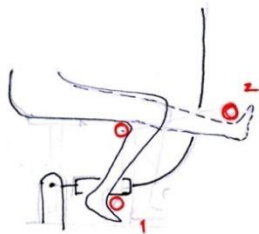
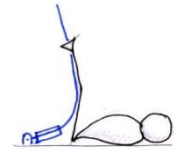
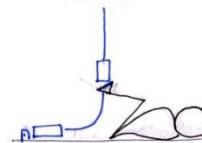
leg press



Multi
press



leg press



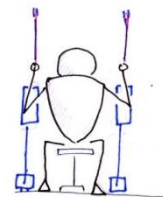
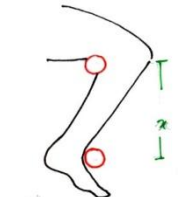
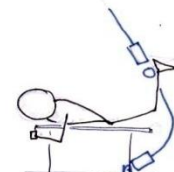
lateral
pulls



leg extensions

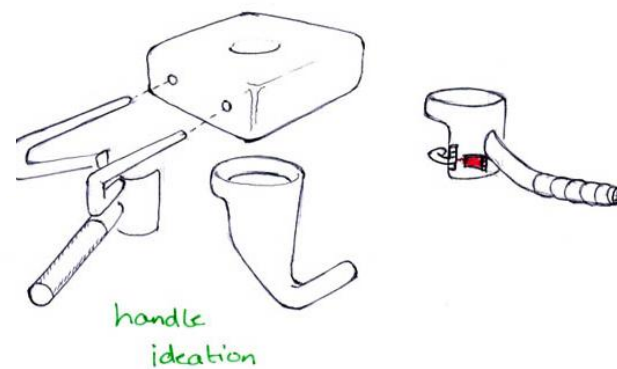
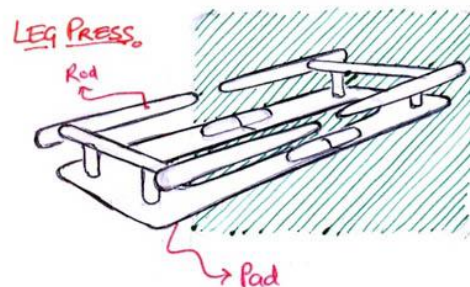
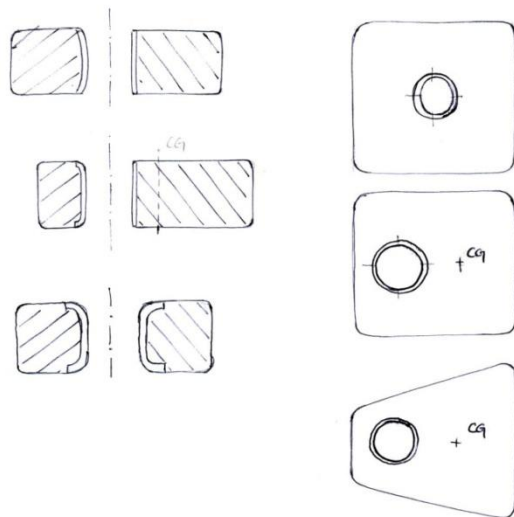
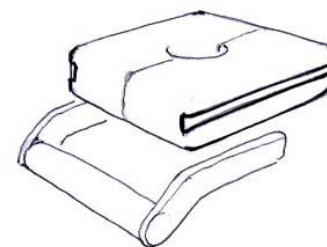
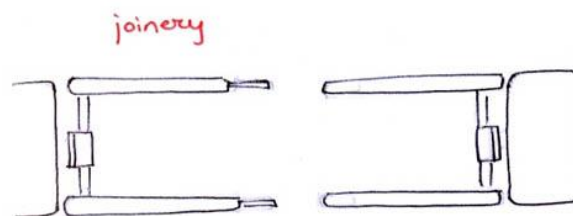
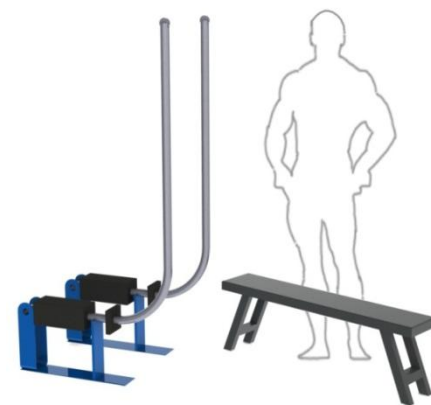
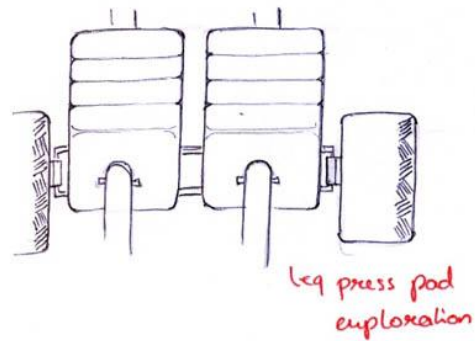
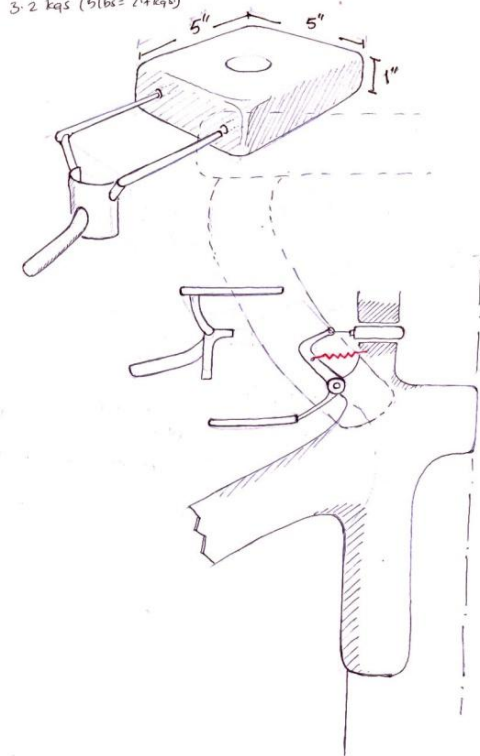


leg curls



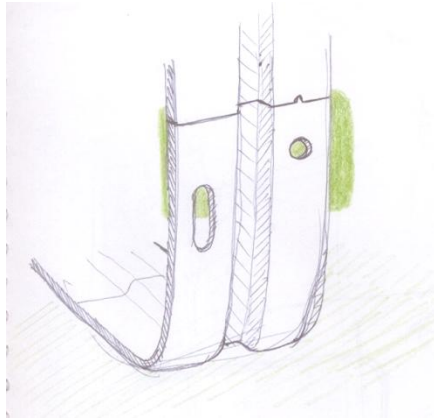
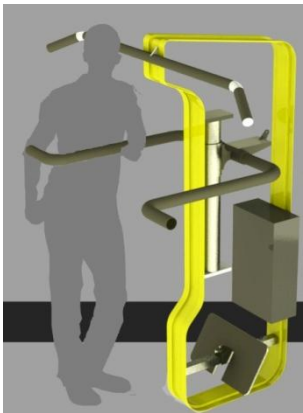
Concept 1: Exercises

3.2 kgs (5lbs = 2.3 kgs)



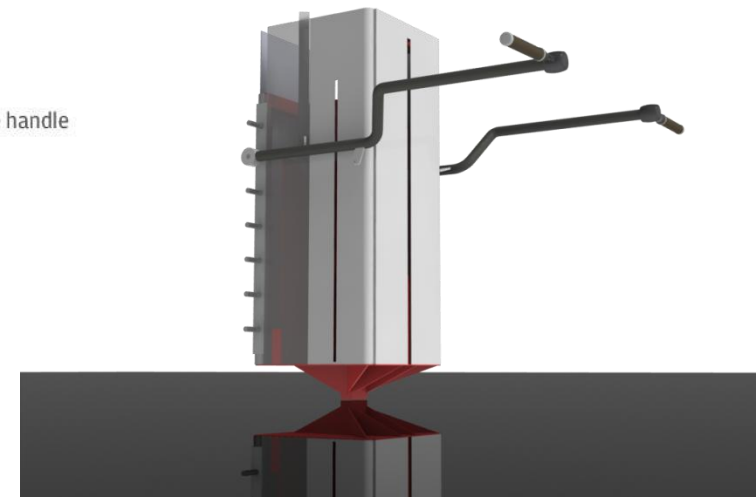
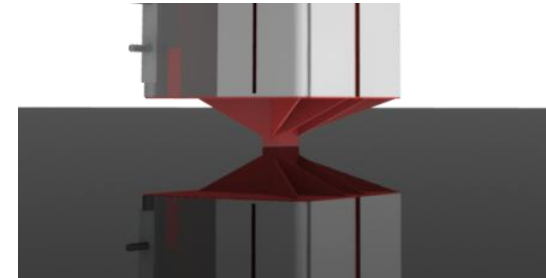
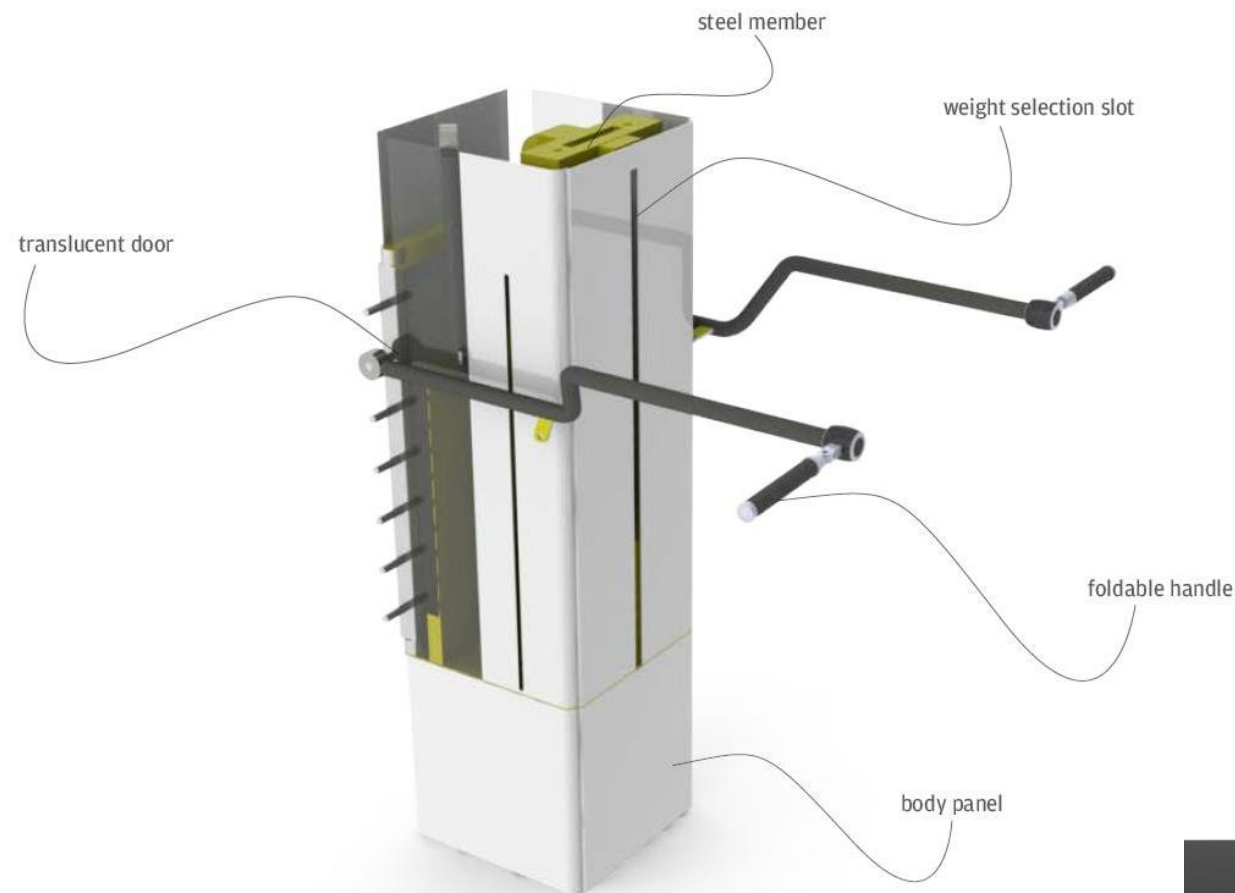
Concept 2: Steel Band

- **Functionality:** 3 exercises included
- **Compactness:** very compact. Tall, however.
- **Build quality and Visual appeal:** Lightweight,, strong, sporty looking.



Concept 3

- **Functionality:** all 3 exercises.
- **Compactness:** is very compact.
- **Build quality and Visual appeal:** Clean and Sleek form. Contemporary looks. All mechanism hidden inside outer body.



Final concept

Final Concept- Iteration

1

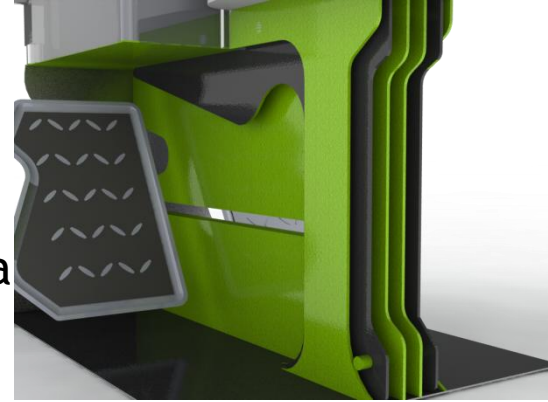


- ***Build and Design:*** inspired by a tree form, the product takes support from the ground up and has a central 'trunk' which acts as a support for all other mountings.

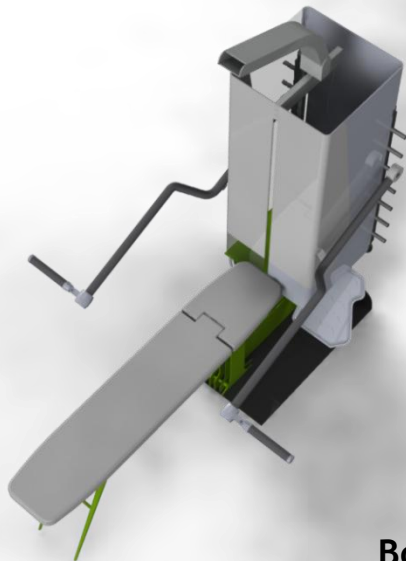
- ***Compactness:*** 400 x 700 x 1650 mm.

- ***Aesthetics:*** Base is Clean and good looking, the upper part looks like an after-thought

First iteration



Bottom Support Detail



Boxy- top view



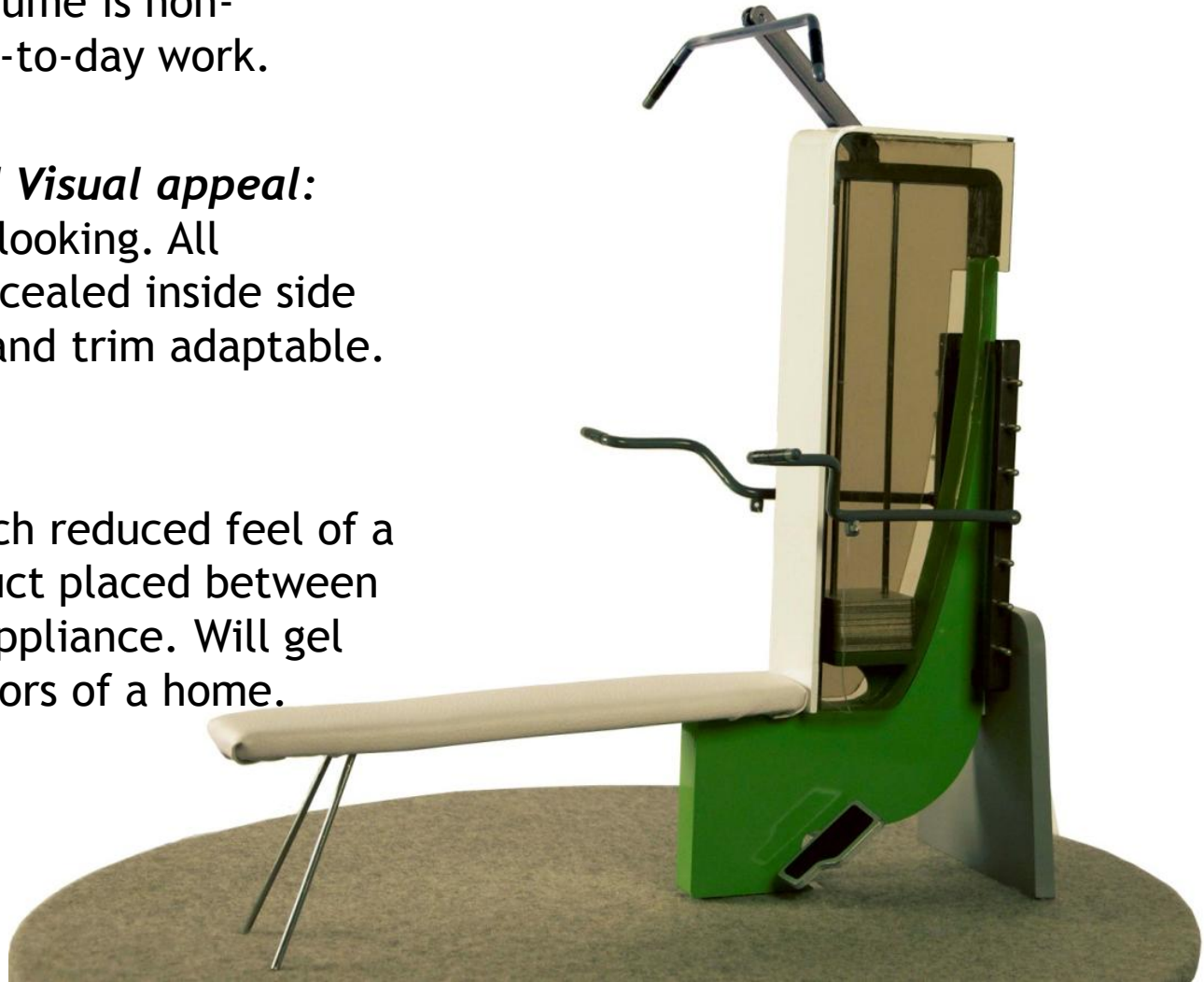
Final Concept

Home Gym Pro

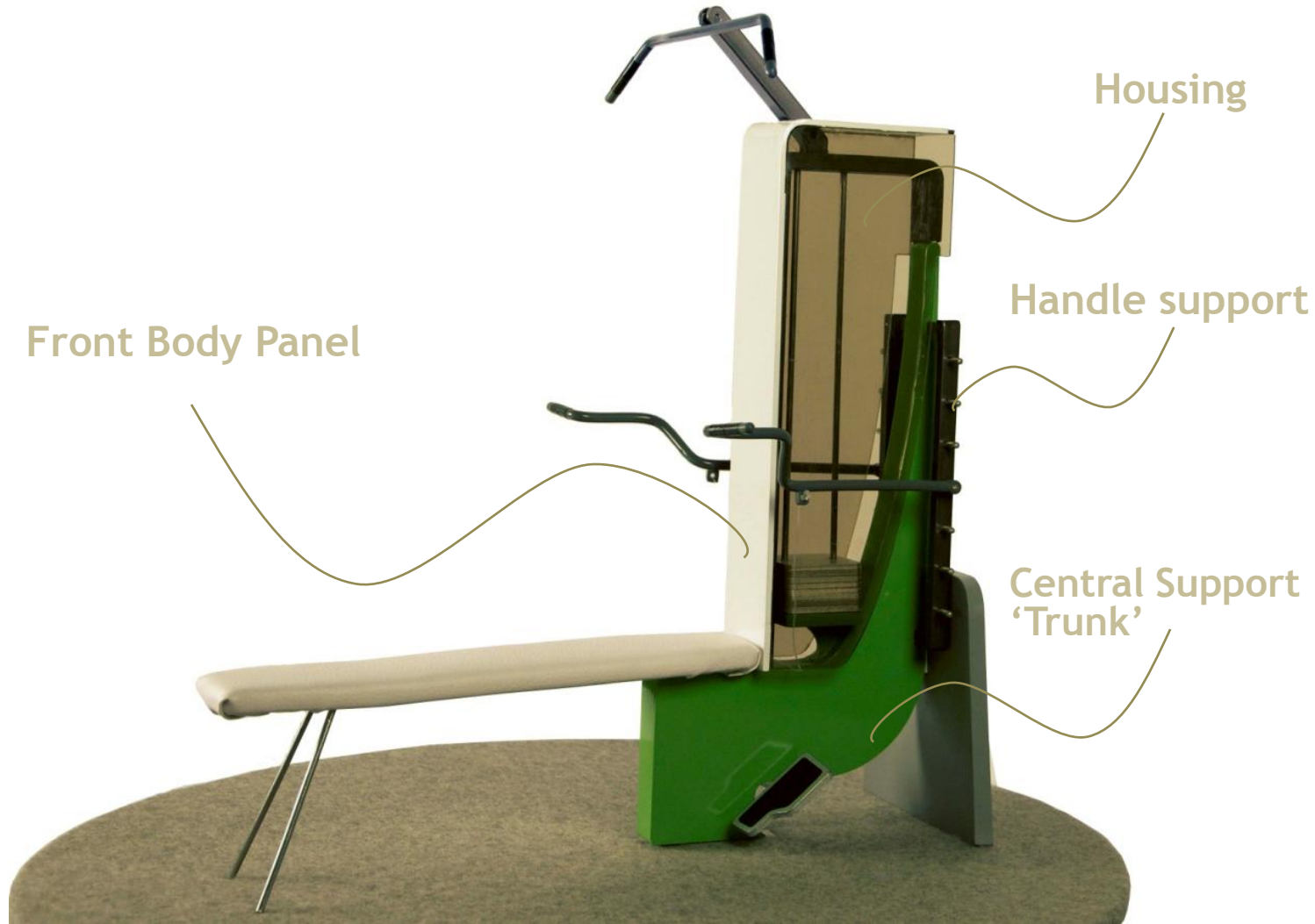


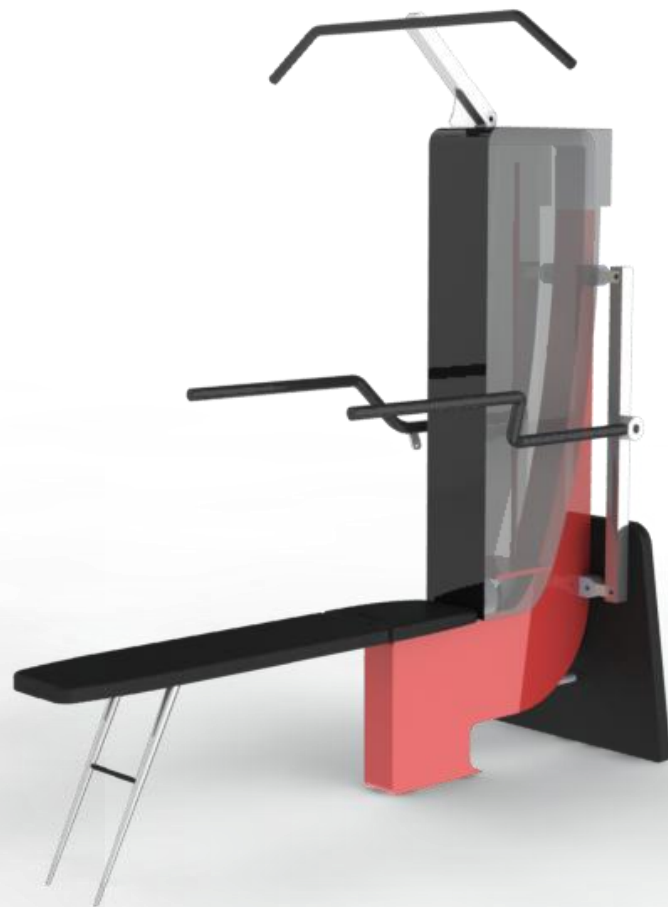
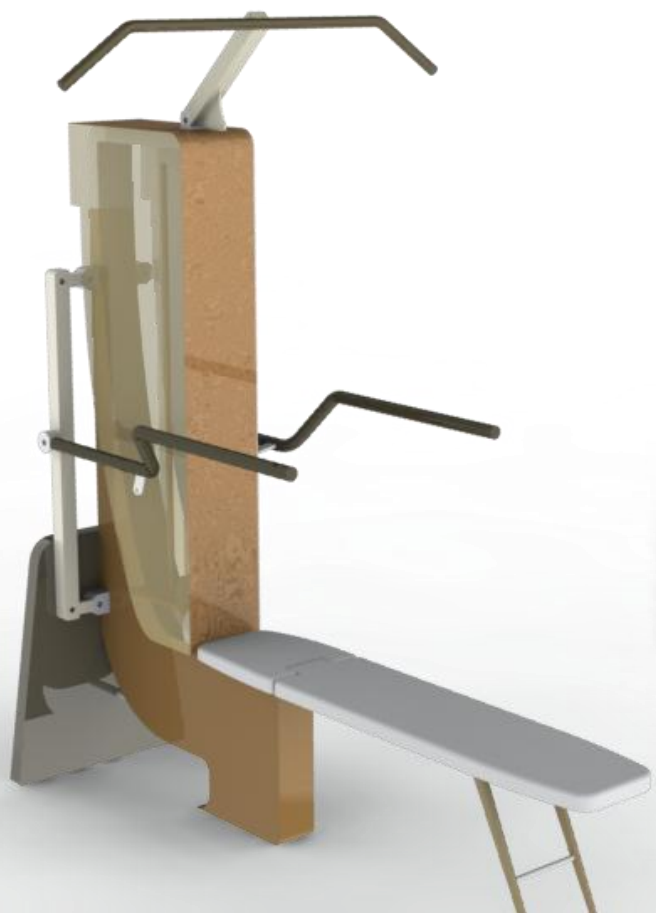
Final Concept

- **Functionality:** 3 exercises
- **Compactness:** Ultra compact. Fits against the wall. All exercises in front. Small volume is non-intrusive in day-to-day work.
- **Aesthetics and Visual appeal:** Clean, elegant looking. All mechanism concealed inside side covers. Colors and trim adaptable. Easy to use
- **Semantics:** Much reduced feel of a machine, product placed between furniture and appliance. Will gel well with interiors of a home.



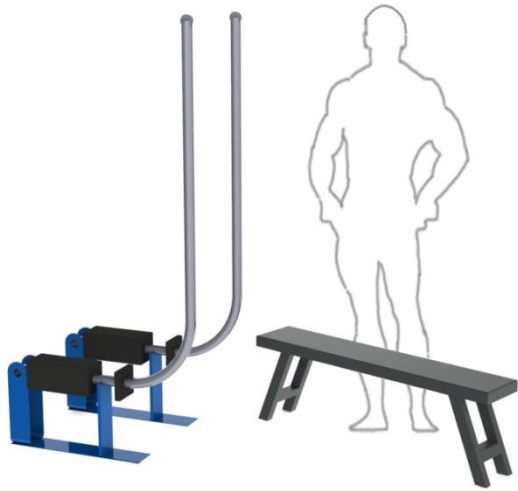
Final Concept



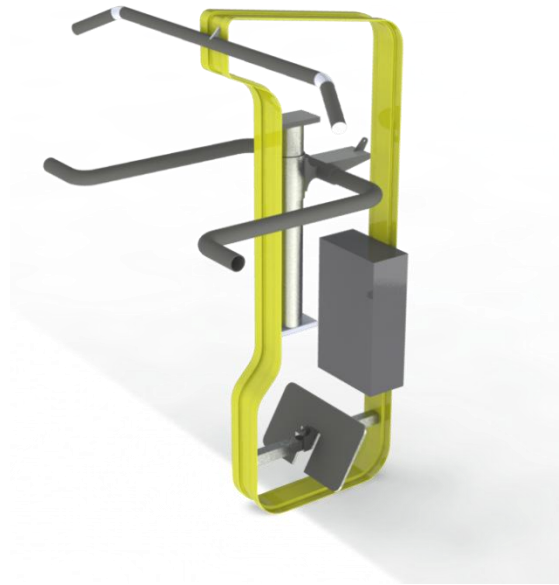


Evaluation + graphs

Evaluation



Concept 1

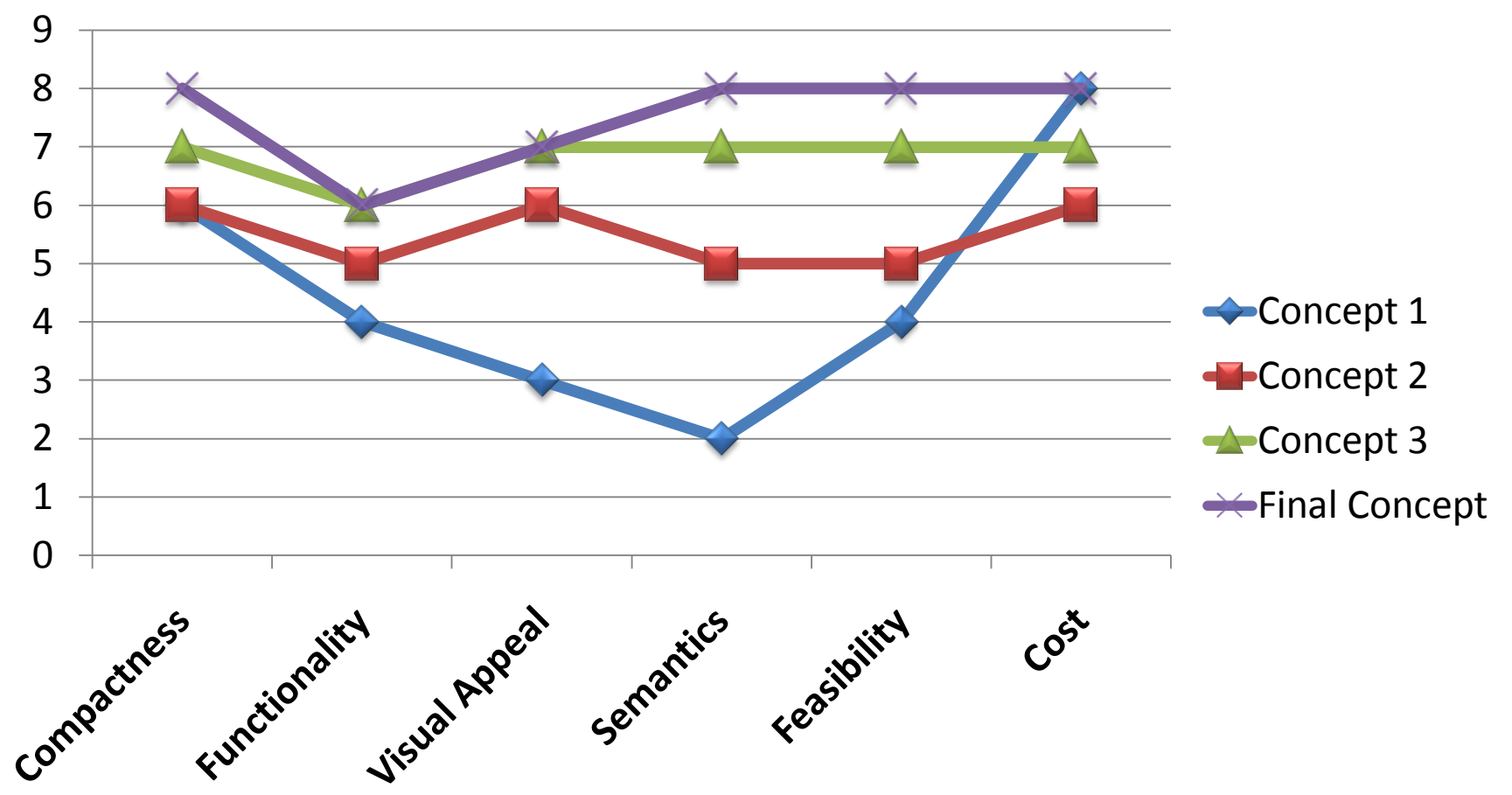


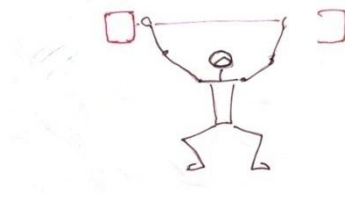
Concept 2



Concept 3

Evaluation





Thank You