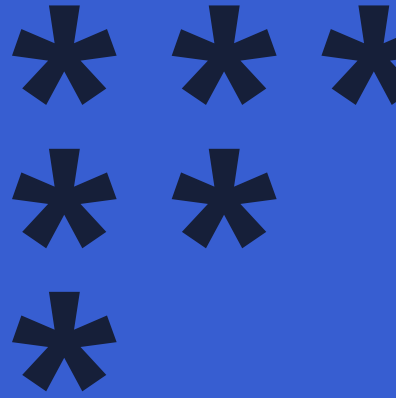


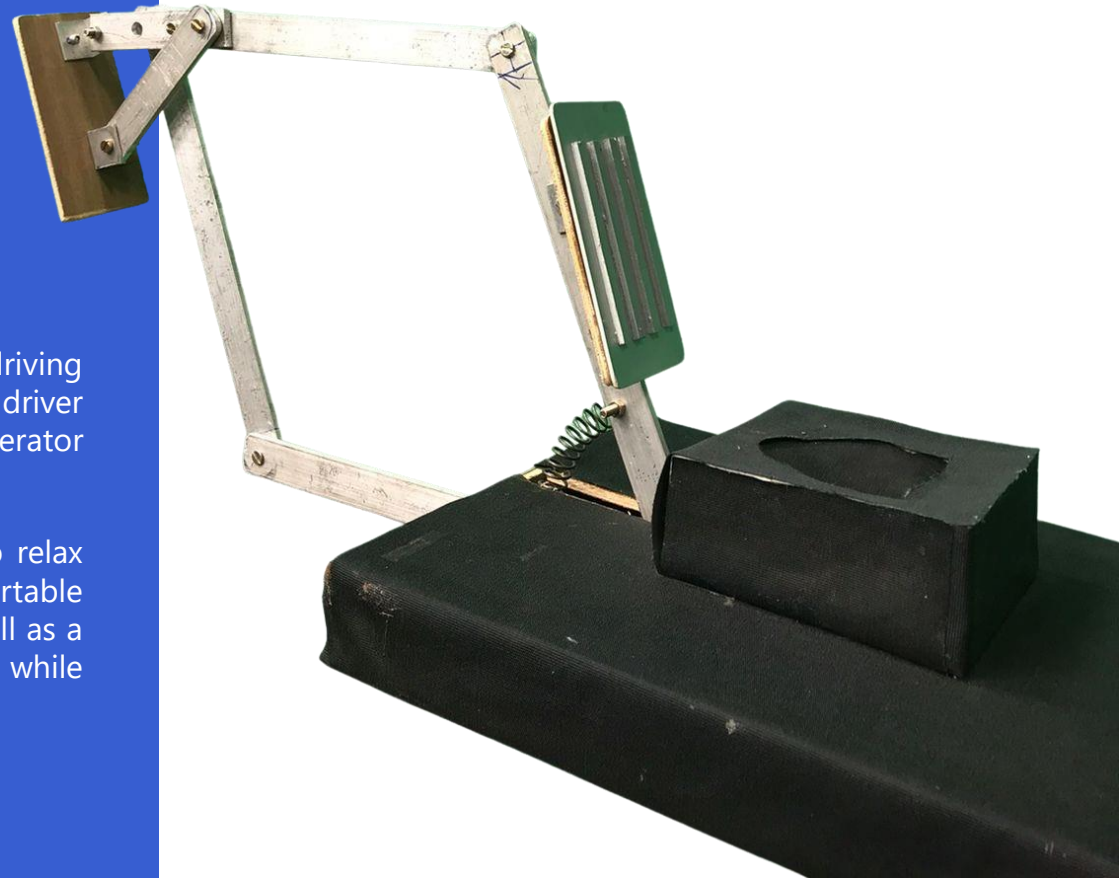
Device to Deal with Driver's Foot



Integrated Product Development I (DES633A)

About The Product

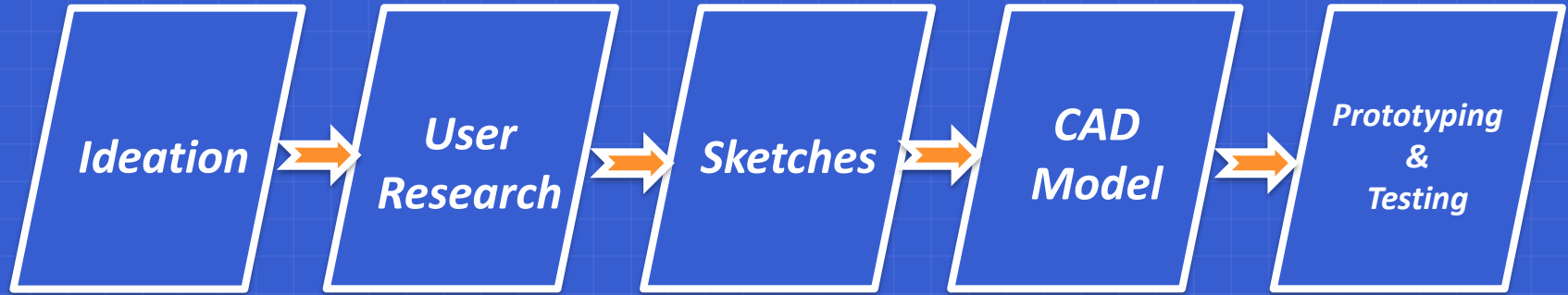
- * This product aims to ease the driving experience of a long-route truck & bus driver by reducing their effort to press the accelerator for a prolonged period.
- * Our design will also allow the drivers to relax their feet/legs by offering a new comfortable inclination angle of the accelerator as well as a new relaxing position for foot placement while driving on long route journeys.





Need Of the Product

- ❖ Stiffness in the right foot of the driver, pain in the heel, knee, entire feet, or leg due to prolonged driving hours.
- ❖ Serious lifetime health issues identified like Plantar Fasciitis & Heel Spur.
- ❖ Accidents happen due to the usage of unsafe means to provide relaxation to the foot/leg (example – the use of stone/brick placed on the accelerator).
- ❖ Drivers consume unrecommended drugs to ease the pain.
- ❖ Affects the afterlife of the affected drivers – gait, profession, unrecoverable effects in feet.



User Research



We prepared a questionnaire & then met with drivers with trucks from different manufacturers to visualize and analyze the actual problem.



Valuable Insights



They want something which is easy to install & uninstall according to the usage.



Something which has a low operating cost and easy maintenance.

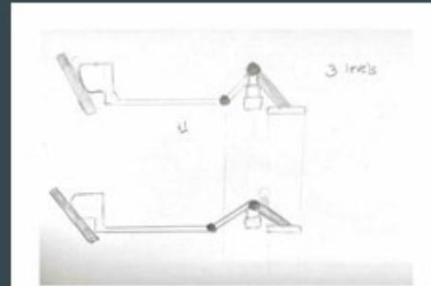
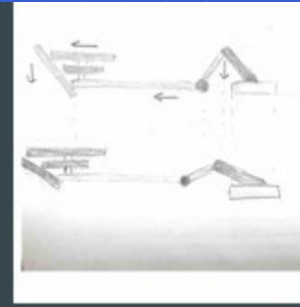
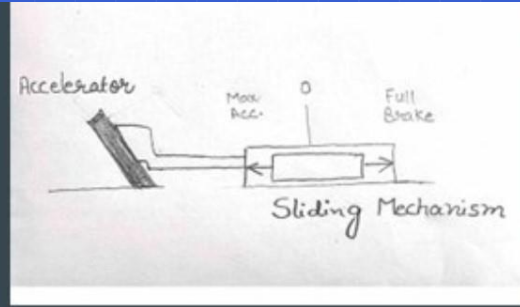
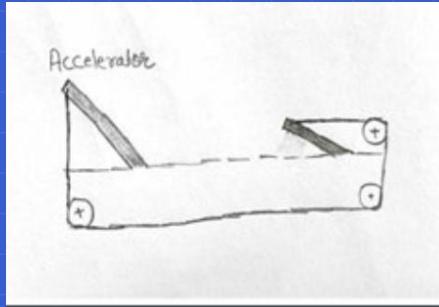


Price of the product should not exceed limit of INR 1000.



We have to make a product which can be adjustable according to any kind of truck/bus.

Conceptual Sketches



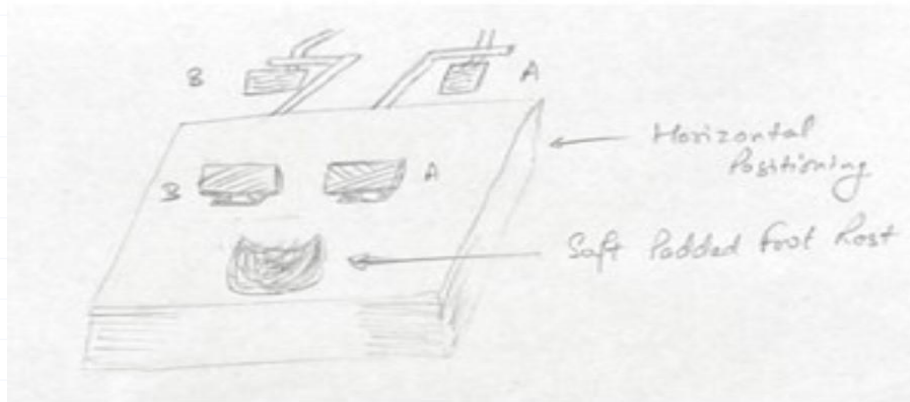
Factors considered for finalizing the concept

* Functionality

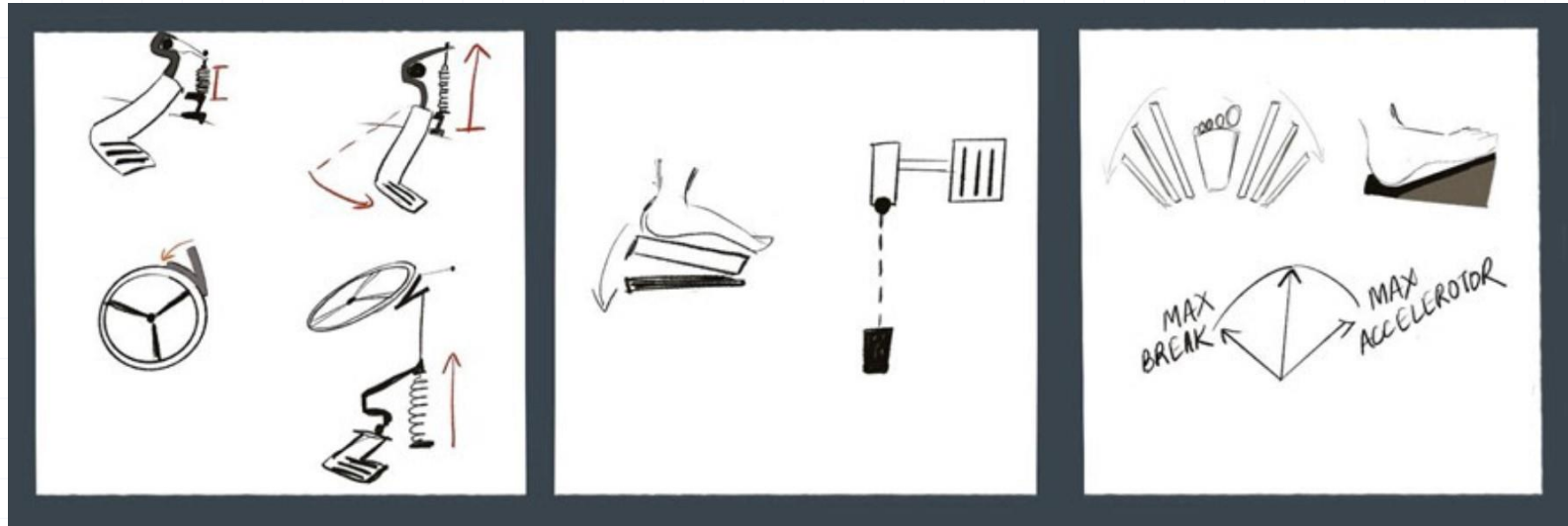
* Will it work?

* Timeline

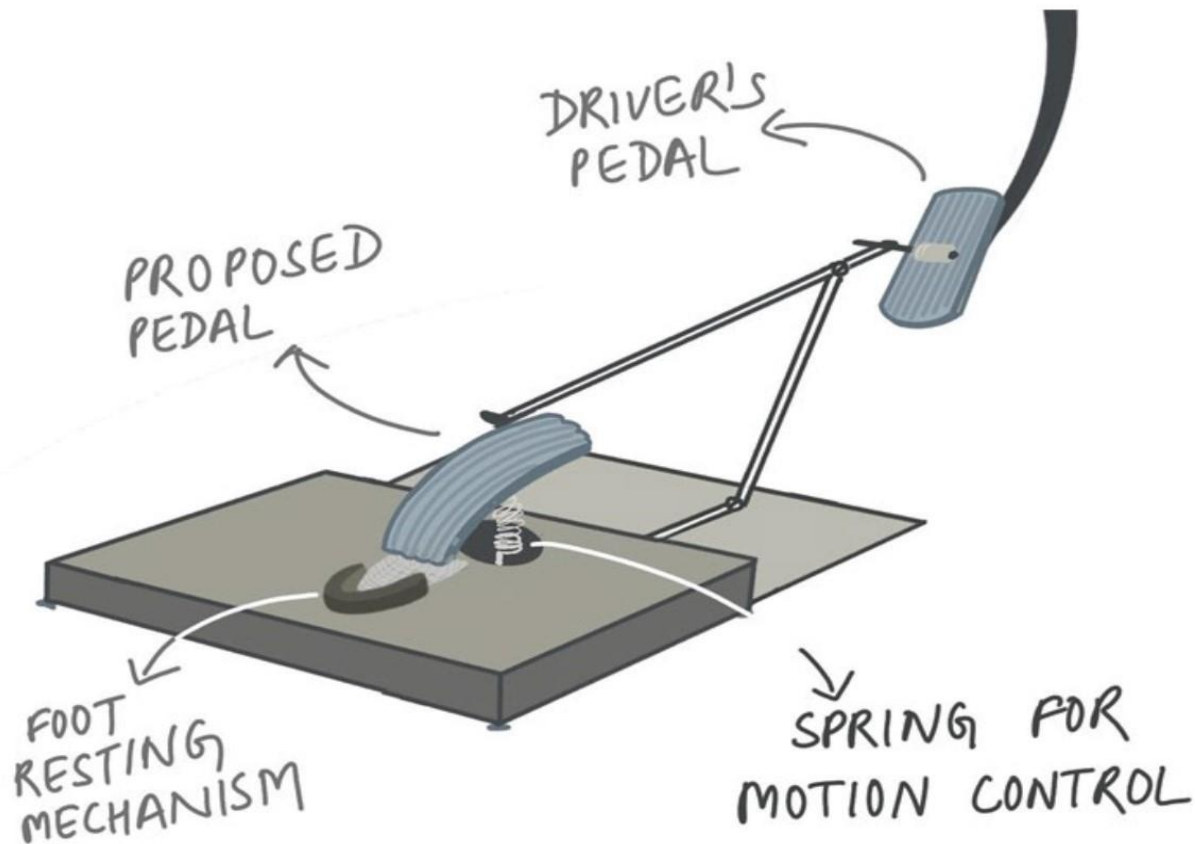
* Can we make it in limited time?



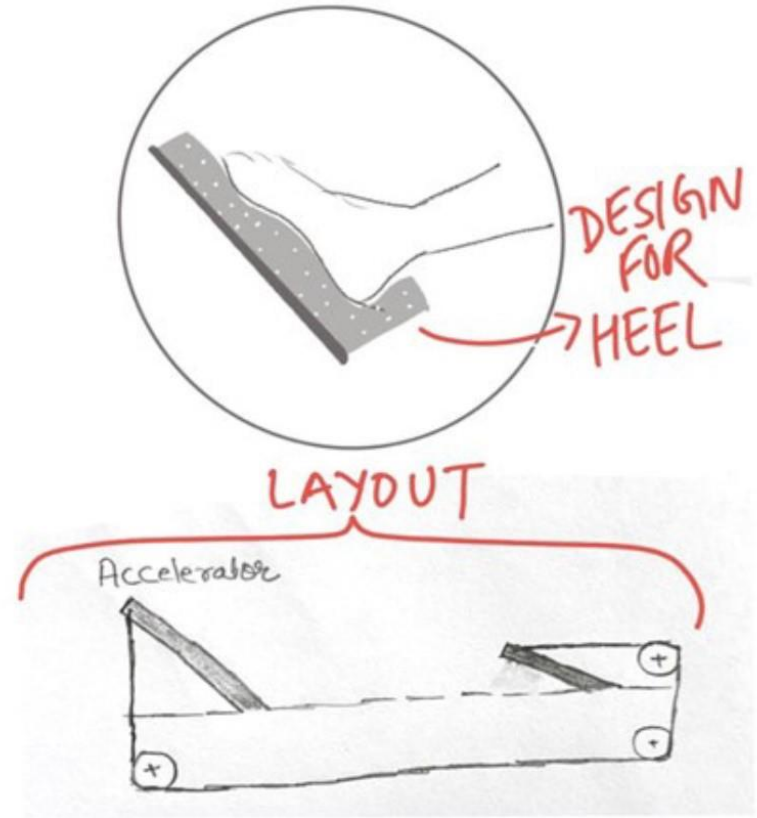
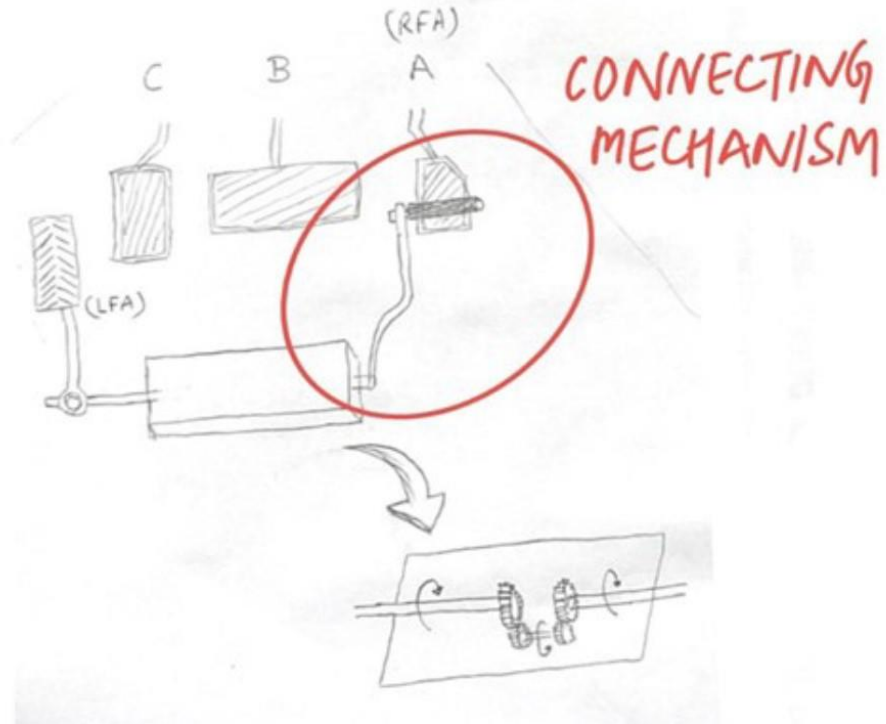
Cognitive Behavior

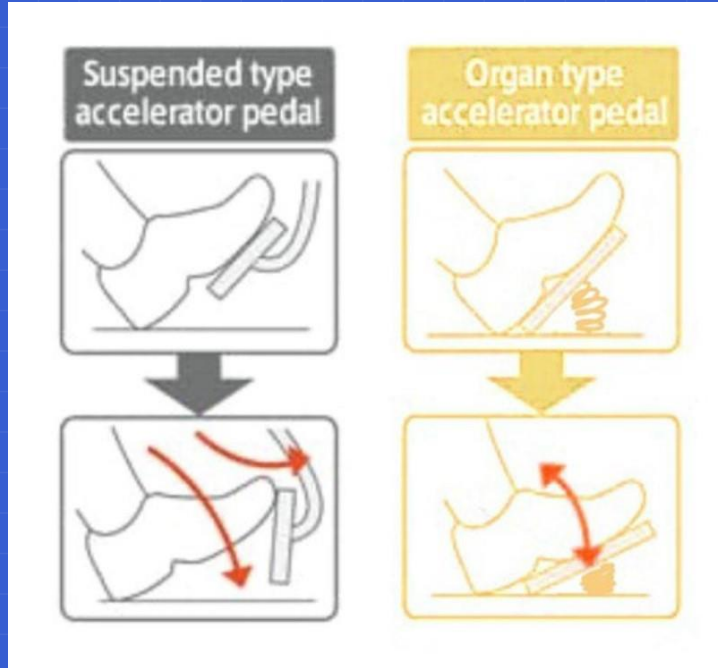


PROPOSED
MODEL



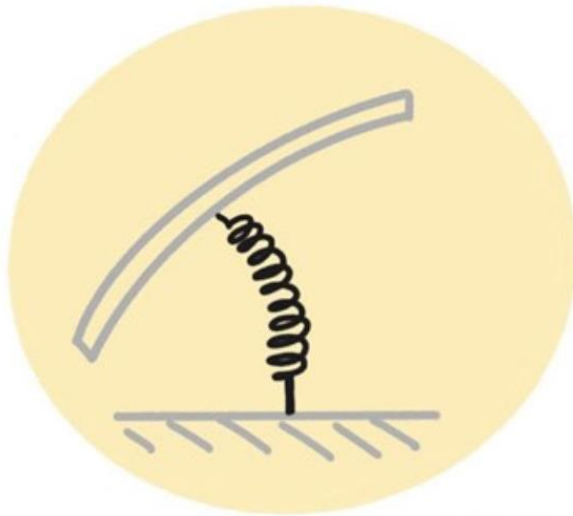
Concept Used:



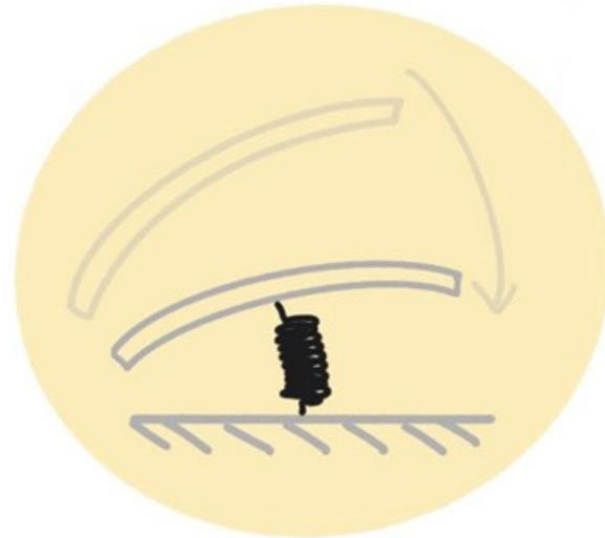


Ergonomic Paddle Design

Spring Mechanism



MINIMUM SPEED



MAXIMUM SPEED

CAD *Model Prototyping*



Final Product



Components & Materials Used

Components	Materials
Ergonomic Pedal	Rubber & Steel
Elevated Base Platform	Wood
Footrest Pads	Rubber Sheet
Heel Support	Memory Foam
Joining Links	Galvanised Steel
Helical Spring	Hardened Steel

Product Cost Breakdown

S. No.	Cost Type	Cost per Unit (INR)
1	Raw Material	400
2	Manufacturing	50
3	Factory Overhead	40
4	Logistic & Others	30
5	Marketing	80
6	MRP	999
7	Profit	399

- We find these numbers by benchmarking other automotive products to analyze our product's performance-to-cost ratio.
- In initial phase we try to keep our product principle based on mechanics only, later we can switch to solenoid valve & electronics for better precision & accuracy.

Pricing & Cost-Benefit Analysis

Based on our calculation that the selling price of our product will be 999/- & there are approximately 5,00,000 truck/bus drivers in India.

Market volume = Number of target customers × Penetration rate in first 2 years

Market volume = $5,00,000 \times 0.4$ (We assumed this number for the initial phase i.e. early adopters)

Market Value = Market Volume × Unit price of a product

Market Value = $2,00,000 \times 999$

Estimated Market Value = 19,98,00,000 INR

According to a survey on the status of truck drivers in India, each truck driver drives for almost 11~12 hours in a day on average and earns Rs 117 per hour.

We estimated that with our product they can drive for 30 minutes more in a day So, we can plot the following cost-benefit chart:

Product	Initial Investment	Add on Income per month	Maintenance per month	Return of Investment
Easy drive	999	1300	100	Within a month

Pricing & Cost-Benefit Analysis

This product allows customers to recoup their initial investment within the first month after the purchase of the product. Additional benefits that are not incorporated in the return on investment calculation are:

1. It creates a better overall driving experience for the user as it reduces heel pain.
2. It can save their medical expenses which occur due to prolonged hours of driving with the same accelerator design.

Income Projections

Units Sold	1 year	2 year	3 year	4 year
Long route truck & bus driver	25,000	1,00,000	1,00,000	1,00,000
Intercity bus & truck drivers	-	25,000	60,000	1,00,000
Taxi drivers & frequent intercity car drivers	-	-	1,00,000	2,00,000