

REPORT 2: DESIGN CONCEPT AND PITCHING

Work up to project definition and proposal finalization

Project title: Automatic ramp in trains that reduce the gap between the train and platform.	Team ID: 5
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1. The team (Team leader at top, others in alphabetical order)

Enrolment no.	Name	Mobile no.	Email ID (@ahduni.edu.in)
AU25L40001	Dhairya Sanathara	7801906876	dhairyas7@ahduni.edu.in
AU2440126	Hirva Vekariya	6352024178	hirva.v@ahduni.edu.in
AU2440024	Jahnavi Patel	9106129923	jahnavi.p@ahduni.edu.in
AU2440069	Shaanay Kothari	6356400444	shaanay.k@ahduni.edu.in
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2. Project milestones

Start date	04 August 2025
Project Proposal (Report 1)	25 August 2025
Design Proposal (Report 2)	08 September 2025
Final Design Report (Report 3)	01 October 2025
Making and Internal Product Display #1	07 November 2025
Product Display #2 (Open House)	15 November 2025
Project Closure ((Report 4))	22 November 2025

3. Project idea (100 words about the project)

The project focuses to design an automatic ramp system for trains that creates a bridge in the gaps between the train and the platform. The prototype will automatically extend when the train stops at a station and goes back on their own before train get started. Using ramp makes sure convenient boarding and safety for passengers, especially for elderly people, children and those with heavy luggage. It also reduces the risk of tripping or falling accidents caused by uneven gaps. The system will be sensor-based, automated and ensuring smooth operation, thereby enhancing passenger safety, comfort and accessibility in public transportation.

5. Target customer (Describe the people who can benefit from your product, if successful)

The automatic ramp system's main purpose is to be used by everyone who travels by train, regardless of age or physical ability. Everyone can use it and will be beneficial for elderly passengers, differently-abled individuals, children and people carrying heavy luggage or strollers, as it ensures easy and safe movement between the platform and train by creating a little slope connecting the platform. Additionally, it helps railway authorities by reducing the number of accidents and improving accessibility standards. Overall, the product aims to enhance the comfort, safety and convenience of all passengers making train travel more user-friendly for the entire community.

6. Novelty of the product

The uniqueness of this product lies in its semi-automatic ramp design, which requires little manual assistance to operate. This ramp is lightweight, easy to control and easy to handle. It provides a stable and secure bridge between the train and the platform, reducing the risk of tripping. The design focuses on simplicity, cost-effectiveness and easy design using rack and pinion mechanism, making it suitable for use in existing train without complex automation systems while still improving safety and accessibility for all passengers.

7. Specifications of your proposed product

Parameter	Description (quantitative)
Ramp Length	Around 1.2 meters (enough to cover gap between platform and train)
Ramp Width	0.8 meters (for easy movement of passengers, wheelchairs and luggage)
Operation Type	Semi – automatic using rack and pinion mechanism
Sensors	IR sensors to detect platform distance and train stop
Power Supply	Battery – powered (rechargeable) or connected to train's power system

8. Project completion criterion (When will you say that the project is successfully completed?)

The project will be considered successfully completed when the automatic ramp is able to extend and fold back smoothly without any help. It should work safely and support the weight of passengers and luggage without bending. The ramp should create a stable bridge between the train and the platform. If the prototype can work properly several times in a row, helping people get on and off the train easily and safely, we can say that our project is successfully completed.

9. Plan for large scale implementation (How can the product be taken to a large number of beneficiaries?)

After the prototype works successfully, we plan to test it in real conditions by fitting it in one train coach. Based on the feedback from passengers and railway staff, we will make improvements in the design for better safety and comfort. Later, we can collaborate with railway authorities and manufacturing companies to produce the ramps in large numbers. With proper training for installation and maintenance, this system can be used in many trains across the country to make travel safer and more comfortable for everyone.

10. Estimated funds requirements (Give total, and major items)

Category	Key Components	Estimated Cost (₹)
Materials	Aluminium sheets, mild steel frame, rack & pinion, rollers	₹9,000
Electronics	DC worm-gear motor, motor driver, wiring & control system	₹5,000
Prototype Making	Fabrication, welding, machining, and hardware assembly	₹8,000
Testing & Display	Trial runs, optimization, demo setup, and presentation	₹3,000
Total Estimated Cost		₹25,000

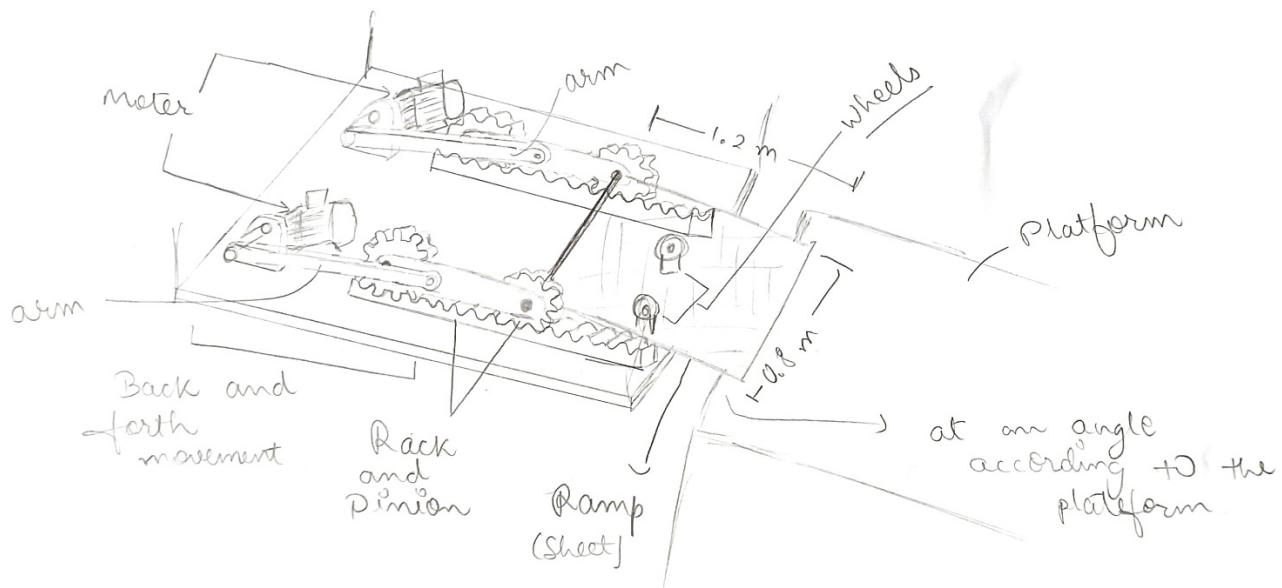
In addition, prepare the following:

Annexure 2-A Team picture with names and roll number and star over the leader.



1. Hirva Vekariya – AU2440126
2. * Dhairyा Sanathara – AU25L40001
3. Tirth Pathar – AU2440238
4. Shaanay Kothari – AU2440069
5. Jahnavi Patel – AU2440024

Annexure 2-B Sketch of final design (freehand with description & pointers)



Annexure 2-B PPT with 5-6 slides to pitch for funding. (Title, About us, Our idea, Beneficiaries, Design, Cost and requested amount, Thank you) – 10-12 minutes.

Automatic Ramp System for Trains

“Bridging the gap between passengers and trains.”

Team 5 - ENR215 - SEC-2

Dhairya Sanathara - AU25L40001

Hirva Vekariya - AU2440126

Jahnavi Patel - AU2440024

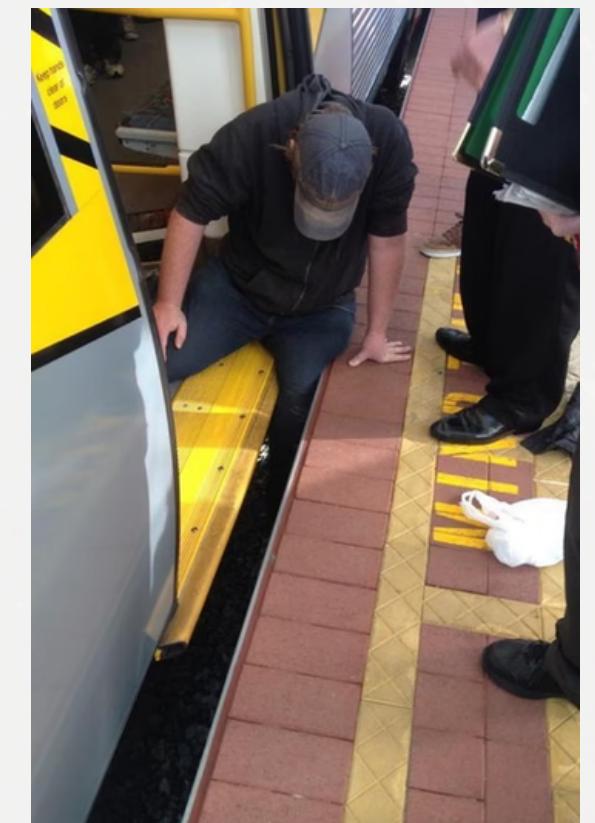
Shaanay Kothari - AU2440069

Tirth Pathar - AU2440238

AHMEDABAD UNIVERSITY

The Problem:

- Train–platform gap causes accidents & inconvenience.
- Affects elderly, differently abled, children, and passengers with luggage
- Railways also face complaints & delays due to accessibility issues.



— OUR IDEA

- **Objective:**

To design an automatic ramp mechanism that bridges the gap between the train and the platform, ensuring safe and convenient boarding for all passengers.



- **Key Features:**

1. Enhanced safety: Prevents tripping or falling due to uneven gaps.
2. User-friendly design: Provides smooth movement for passengers with luggage, children, or mobility challenges.
3. Accessibility focus: Assists elderly and differently-abled individuals for easier train access.





— Beneficiaries

- **Main Beneficiaries**

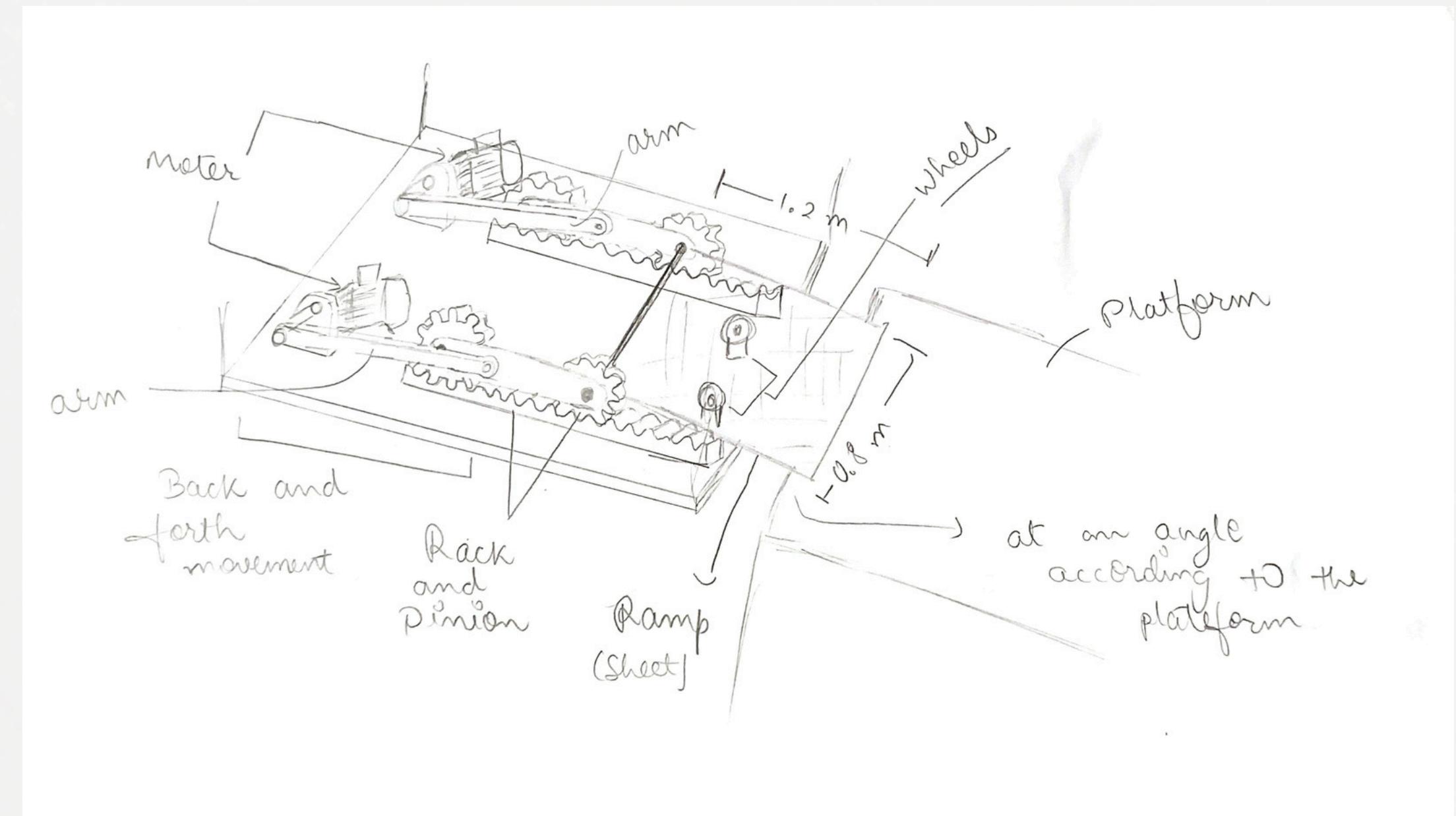
1. Elderly passengers – safer and easier boarding.
2. Differently-abled individuals – accessible movement without external help.
3. Children – prevents tripping or falling accidents.
4. Passengers with heavy luggage or strollers – effortless boarding.
5. Railway authorities – fewer accidents and improved accessibility standards.

- **Unique Advantages**

1. Semi-automatic, lightweight ramp requiring minimal manual assistance.
2. Rack and pinion mechanism – simple, cost-effective, and compatible with existing trains.
3. Improves safety, comfort, and inclusivity in public transportation.

DESIGN

- Semi-automatic rack & pinion mechanism
- Pinion-on-hinge design for compact, stable motion.
- Rollers underneath for friction-free movement.
- Mechanical end-stops ensure safety — no sensors required.
- Stable, foldable, easy to maintain



COST & FUNDING

Category	Key Components	Estimated Cost (₹)
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Thank You