



अवन्ती  
AVANTI FELLOWS

# RAIL Fellowship Symposium

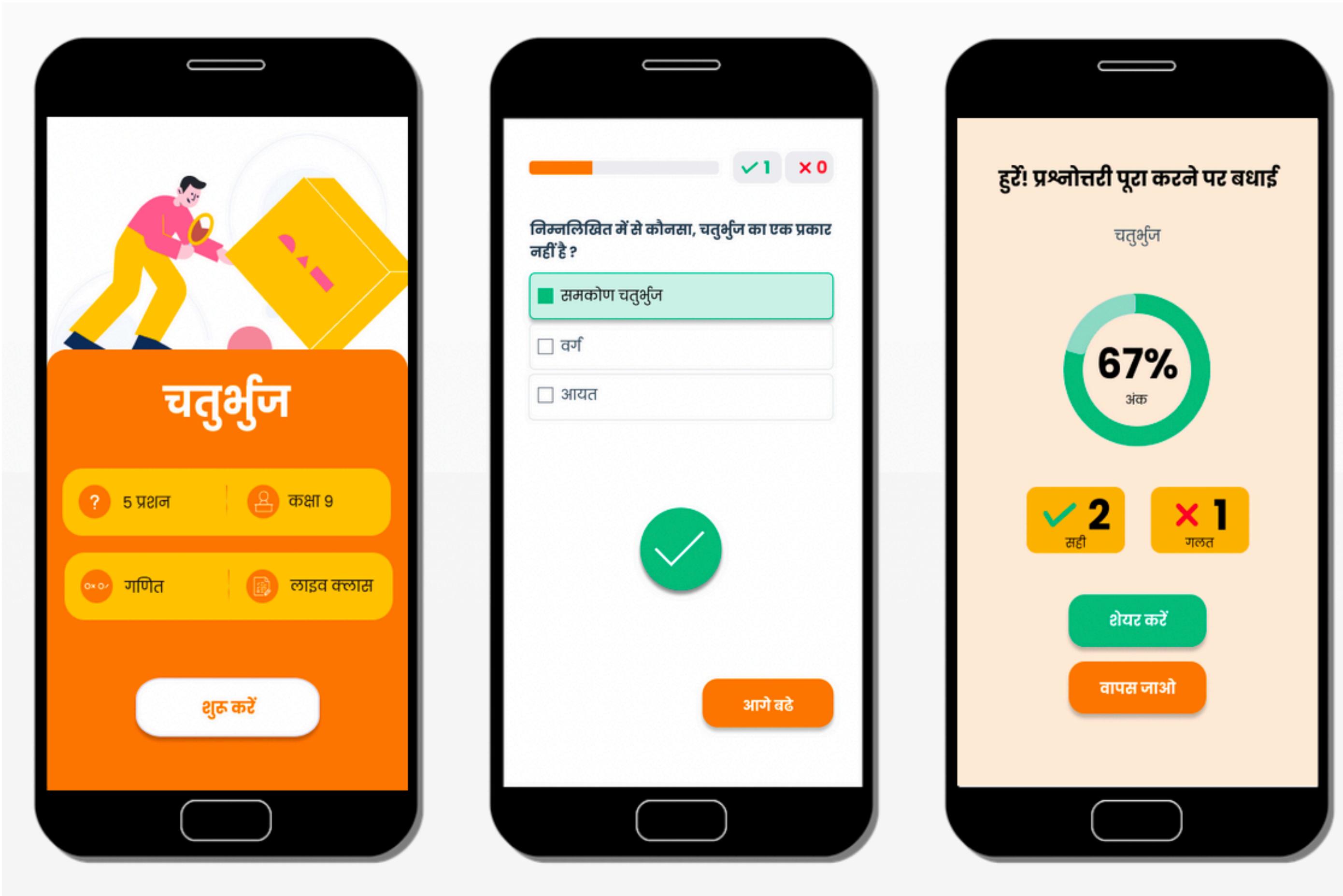
## A Tech Worker's Perspective

Bengaluru, 28th Nov. 2024  
[suryateja@avantifellows.org](mailto:suryateja@avantifellows.org)

# AF Mission

Help students lift themselves & their families out of poverty in a *single generation* by helping them qualify to *quality professional undergraduate courses* & develop the skills needed to build successful careers

# Quiz Engine



A screenshot of the NTA Web Application interface, showing a sample paper with the following details:

- Question 3:** 248  
Options: (O) 1, (O) 2, (O) 3, (O) 4
- Question 4:** 256  
Options: (O) 1, (O) 2, (O) 3, (O) 4

At the bottom are buttons for "SAVE & NEXT", "CLEAR", "SAVE & MARK FOR REVIEW", "MARK FOR REVIEW & NEXT", "<< BACK", "NEXT >>", and "SUBMIT".

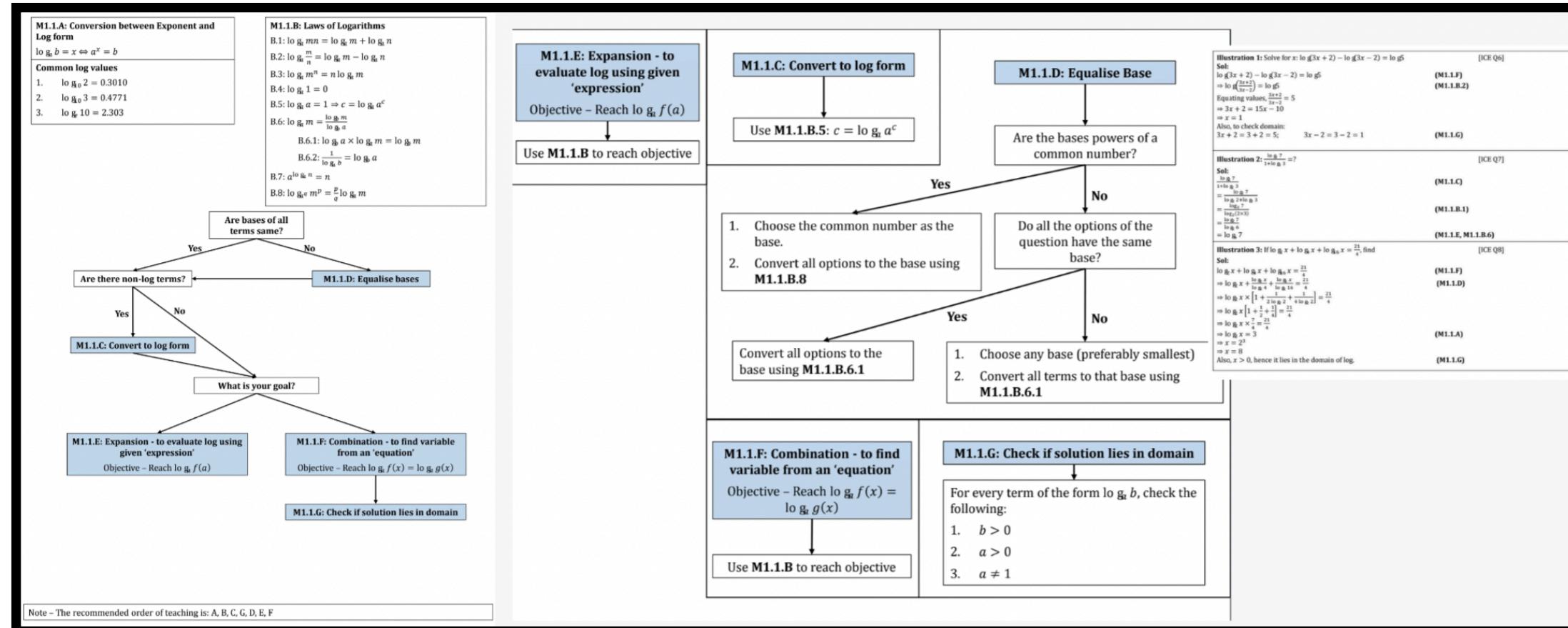
To the right, a legend defines the status codes:

- Not Visited (Grey box)
- Not Answered (Orange box)
- Answered (Green box)
- Marked for Review (Purple box)
- Answered & Marked for Review (Blue box)

A grid of numbers from 01 to 56 is also visible.

NTA Web Application with ~20 sample papers

# Quiz Engine Flow



# Question Bank (~1.5 Lakh), Worksheets **Curriculum & Production Teams** + *Teachers*

# Operations Team + Teachers

# Tech Team

# → Reports & Analysis

# An issue in the QE Flow

Student ID: test\_rahul

**DELHI Dropper Batch JEE PT-1**  
2023-08-13

0%

Click here to review your answers

**OVERALL PERFORMANCE**

Marks	-6
Unattempted	59
Wrong Answers	14
Correct Answers	2
Partially Correct	0
Percentage	0
Accuracy	12.5

See Results

B08&B09\_PB-MT-PCB Id: test\_admin

Q.4 | Single Choice Physics - Section A

An object of mass 3 kg is at rest. Now a force of  $\vec{F} = 6t^2\hat{i} + 4t\hat{j}$  is applied on the object then velocity of object at  $t = 3$  sec is

$18\hat{i} + 3\hat{j}$

$18\hat{i} + 6\hat{j}$

$3\hat{i} + 18\hat{j}$

$18\hat{i} + 4\hat{j}$

**Solution:**

Mass,  $m = 3 \text{ kg}$ , force,  $F = 6t^2\hat{i} + 4t\hat{j}$   
 $\therefore$  acceleration  
 $a = F/m = \frac{6t^2\hat{i} + 4t\hat{j}}{3} = 2t^2\hat{i} + \frac{4}{3}t\hat{j}$   
Now,  $a = \frac{dv}{dt} = 2t^2\hat{i} + \frac{4}{3}t\hat{j}$

See Results

B08&B09\_PB-MT-PCB Id: test\_admin

Q.3 | Single Choice Physics - Section A

A projectile is thrown from a point in a horizontal plane such that the horizontal and vertical velocities are  $9.8 \text{ ms}^{-1}$  and  $19.6 \text{ ms}^{-1}$ . It will strike the plane after covering distance of

$39.2 \text{ m}$

$19.6 \text{ m}$

$9.8 \text{ m}$

$4.9 \text{ m}$

**Solution:**

$R = \frac{2u_x u_y}{g} = \frac{2 \times 9.8 \times 19.6}{9.8} = 39.2 \text{ m.}$

See Results

B08&B09\_PB-MT-PCB Id: test\_admin

Q.1 | Single Choice Physics - Section A

What is the dimensions of impedance?

$[ML^2T^{-3}I^{-2}]$

$[M^{-1}L^{-2}T^3I^2]$

$[ML^3T^{-3}I^{-2}]$

$[M^{-1}L^{-3}T^3I^2]$

**Solution:**

We have  
Impedance = Resistance =  $\frac{V}{I}$   
 $= \frac{W}{q \times I} = \frac{W}{I^2 t} = \frac{ML^2T^{-2}}{I^2 T} = ML^2T^{-3}I^{-2}$

Report Card

Students rarely revisit quizzes :(

# AI Intervention

HP GRADE 9 FOUN... Id: test\_count\_1

Q.3 | Single Choice Maths

A तीन-चौथाई समय में उससे आधा काम करता है। यदि उन्हें मिलकर काम पूरा करने में 18 दिन लगते हैं, तो B को इसे पूरा करने में कितना समय लगेगा?

A does half as much work as B in three-fourth of the time. If together they take 18 days to complete the work, how much time shall B take to do it?

30 days  
 35 days  
 40 days  
 None of these

See Results

GPT-4O →

Review: HP GRADE ... Id: test\_count\_1

Q.3 | Single Choice Total Questions: 4

If person A can complete a task in 12 days, how many days will it take for person B to complete the same task if B works twice as fast as A?

6 days  
 12 days  
 24 days

Solution:

Since B works twice as fast as A, B will take half the time A takes to complete the task. Therefore, B will take 6 days.

< Continue

Review: HP GRADE ... Id: test\_count\_1

Q.3 | Single Choice Total Questions: 4

Is it true that if one person does half the work of another in the same amount of time, they will take twice as long to complete the same task alone?

Yes  
 No

Solution:

If one person does half the work of another in the same amount of time, they will indeed take twice as long to complete the same task alone. This is because the rate of work is directly proportional to the time taken.

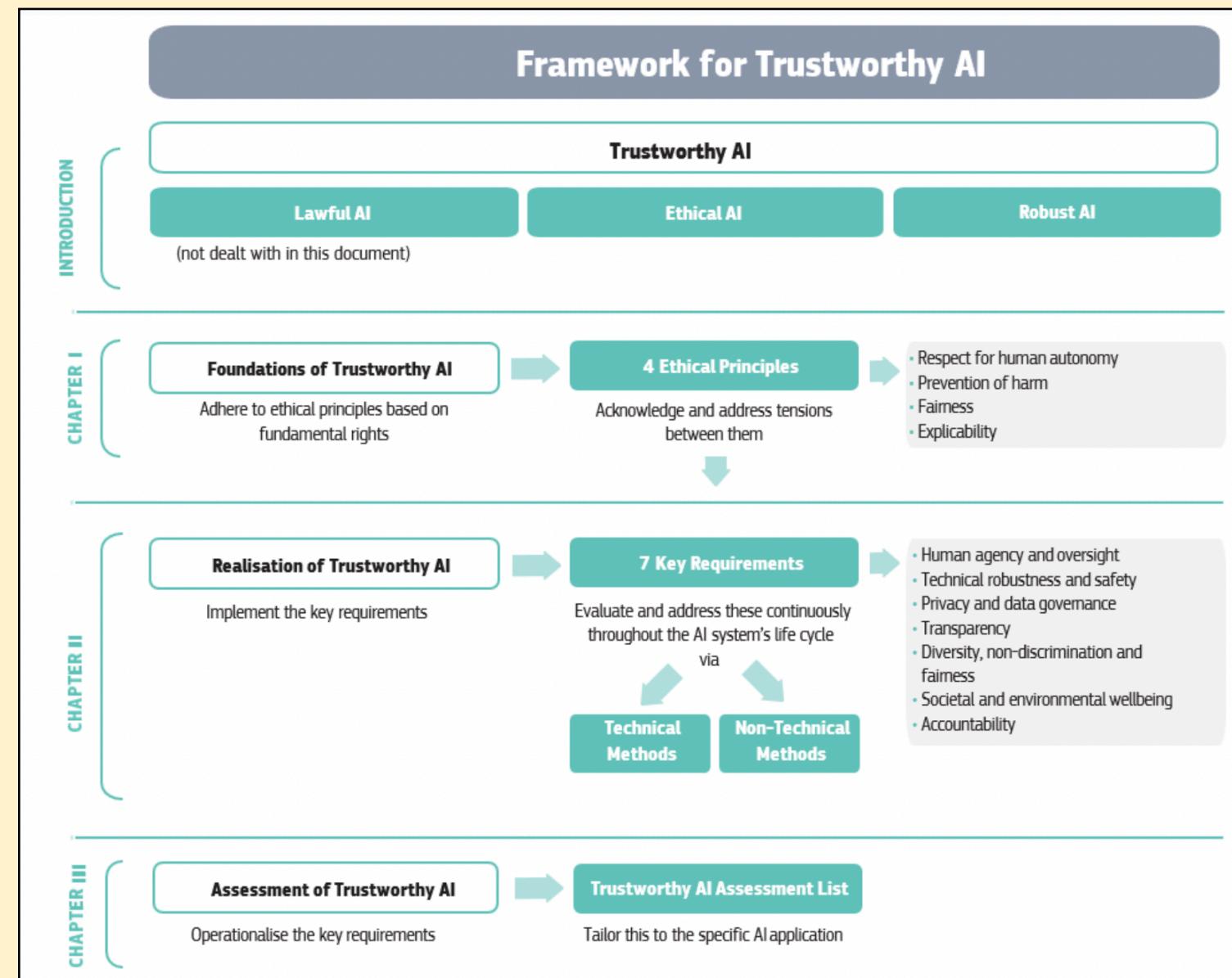
< Continue

Inactive Learning: Immediately view the correct answer

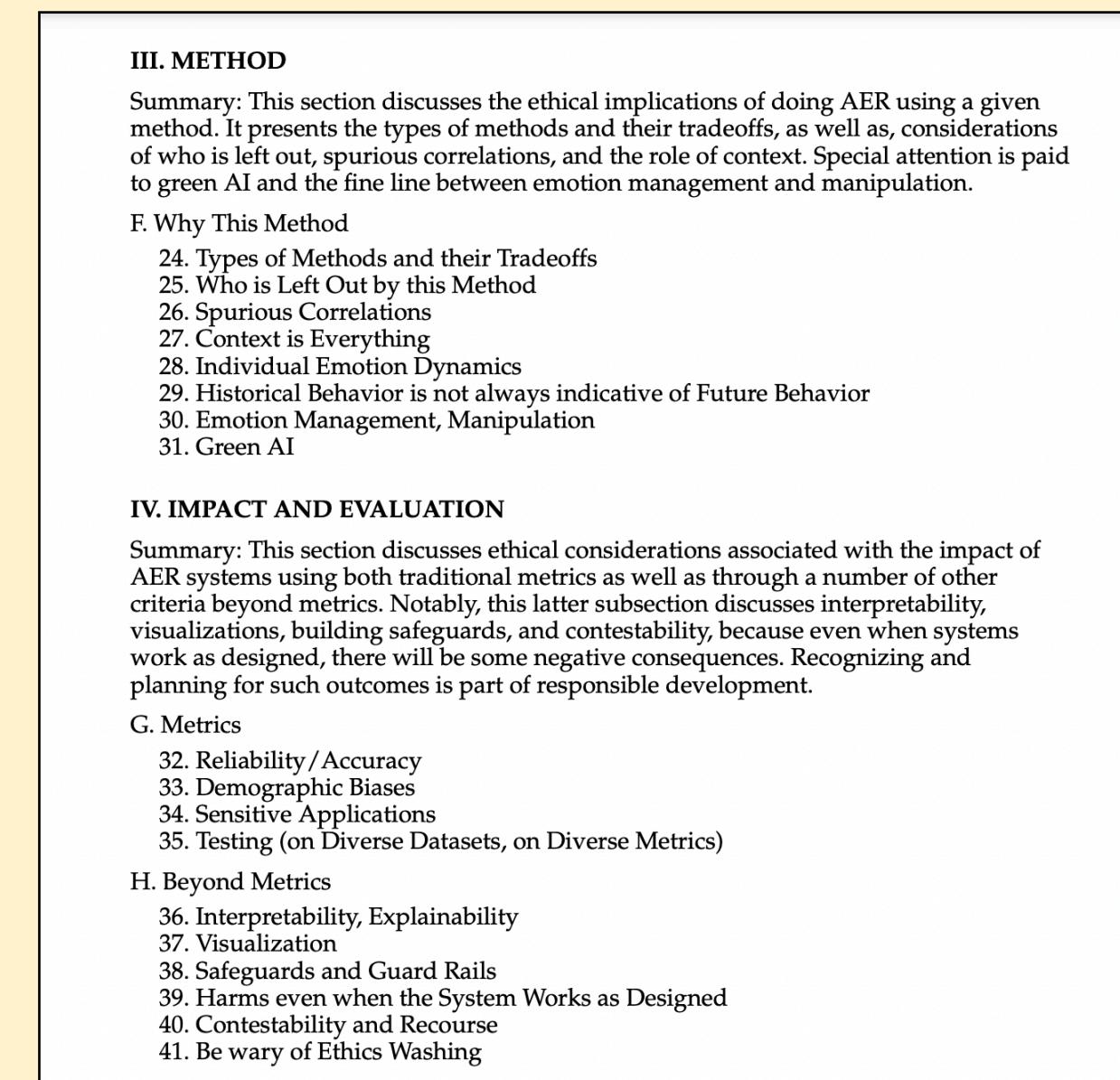
Delayed Feedback: Answer a simpler pedagogical question or a Yes/No question

*Smaller  
Conceptual  
Atomic  
Quick  
(Mostly) correct  
Personalised*

# Frameworks, Checklists, Rubrics, ...



Generic Frameworks



Long Checklists  
45+ points!

- Be interpretable, accountable, transparent, nice, good, fair, ethical

(v/s)

- Moving away from chat-like interface is better as it reduces operational load
- Inquire what teachers think of the tools

Bespoke advice; but may not be widely applicable!

# (1) Alternative Perspectives

- Early conversations with Sarah Newman, director of metaLAB at Harvard.
  - Shared deployment experiences at her institute, enabling valuable comparisons with our own context.
  - **Machine Learner Gap.** It's crucial to adapt foreign implementations to local realities.
  - Example: Tutor Copilot's one-on-one digital tutoring model isn't feasible at the scale of our public school systems.
- Prof. Neha Kumar's Lecture and Research:
  - Insights drawn from her analysis of **ASHA healthcare workers** with Azra Ismail
  - Key concerns (potentially for *teachers*): Job security, fears of replacement, and the use of their work to enhance AI interventions.
  - Key takeaway: Consider who is impacted and how they are impacted, ensuring interventions respect existing roles.

Nithya Sambasivan, Erin Arnesen, Ben Hutchinson, Tulsee Doshi, and Vinodkumar Prabhakaran. 2021. "Re-imagining Algorithmic Fairness in India and Beyond." (FAccT '21).

Wang, Rose E., et al. "Tutor copilot: A human-ai approach for scaling real-time expertise." arXiv preprint arXiv:2410.03017 (2024).

Azra Ismail and Neha Kumar. "AI in Global Health: The View from the Front Lines." CHI (2021).

Dan Meyer, "The Kids That Edtech Writes Off". (2024).

# (2) Interface Design

- Great interaction with Nishita Gill, Founder of Treemouse => Keep the UI simple! Back every design choice with careful experimentation.
- Thin beyond **chat-like interfaces**: Too many interaction points can confuse students.
- Beware of **hidden operational costs**: AI may appear to reduce workload but can quietly take over as a core feature, demanding disproportionate time and effort. Example: Grievance Redressal.

A screenshot of a mobile application interface for a quiz. At the top, there is a header with a menu icon, a timer showing 02:59:35, and a green 'End Test' button. Below the header, the title 'HP GRADE 9 FOUN...' and ID 'Id: test\_count\_2' are displayed. The main content area contains a question in English and Hindi. The question asks: 'A तीन-चौथाई समय में उससे आधा काम करता है। यदि उन्हें मिलकर काम पूरा करने में 18 दिन लगते हैं, तो B को इसे पूरा करने में कितना समय लगेगा?' followed by its English translation. Below the question are four answer options: '30 days', '35 days' (which is selected), '40 days', and 'None of these'. A red 'NOT ANSWERED' button is at the bottom. Navigation buttons for 'Clear', 'Review >', and 'Save & Next' are also present.

Quiz Interface  
Cluttered

A screenshot of a mobile application interface for a revision session. At the top, it shows 'Review: HP GRADE ... Id: test\_count\_2', 'Q.3 | Single Choice', and 'Total Questions: 4'. The main content area displays a single question: 'Is it true that if one person does half the work of another in the same amount of time, they will take twice as long to complete the same task alone?'. Below the question are two answer buttons: 'Yes' (selected) and 'No'. At the bottom, there are navigation buttons for 'Submit' (in a green box) and 'Back' (in a yellow box).

Revision Interface  
Crisp

# (3) Open Source Implementation

- Tarunima Prabhakar's lecture: “*Care as a necessary ethic*”.
- Open source pushes us to build carefully, with a sense of accountability.
- Welcoming interns and contributors builds capacity and spreads values, even if copycats emerge.
- **AI Anti-Marketing.** Share negative results to encourage critical thinking and innovation.

*Session Manager*

The Session Manager interface features a header with the Avanti Fellows logo and navigation links for 'Quizzing Engine', 'Live Classes', and '+ Create Session'. Below this is a table listing four groups:

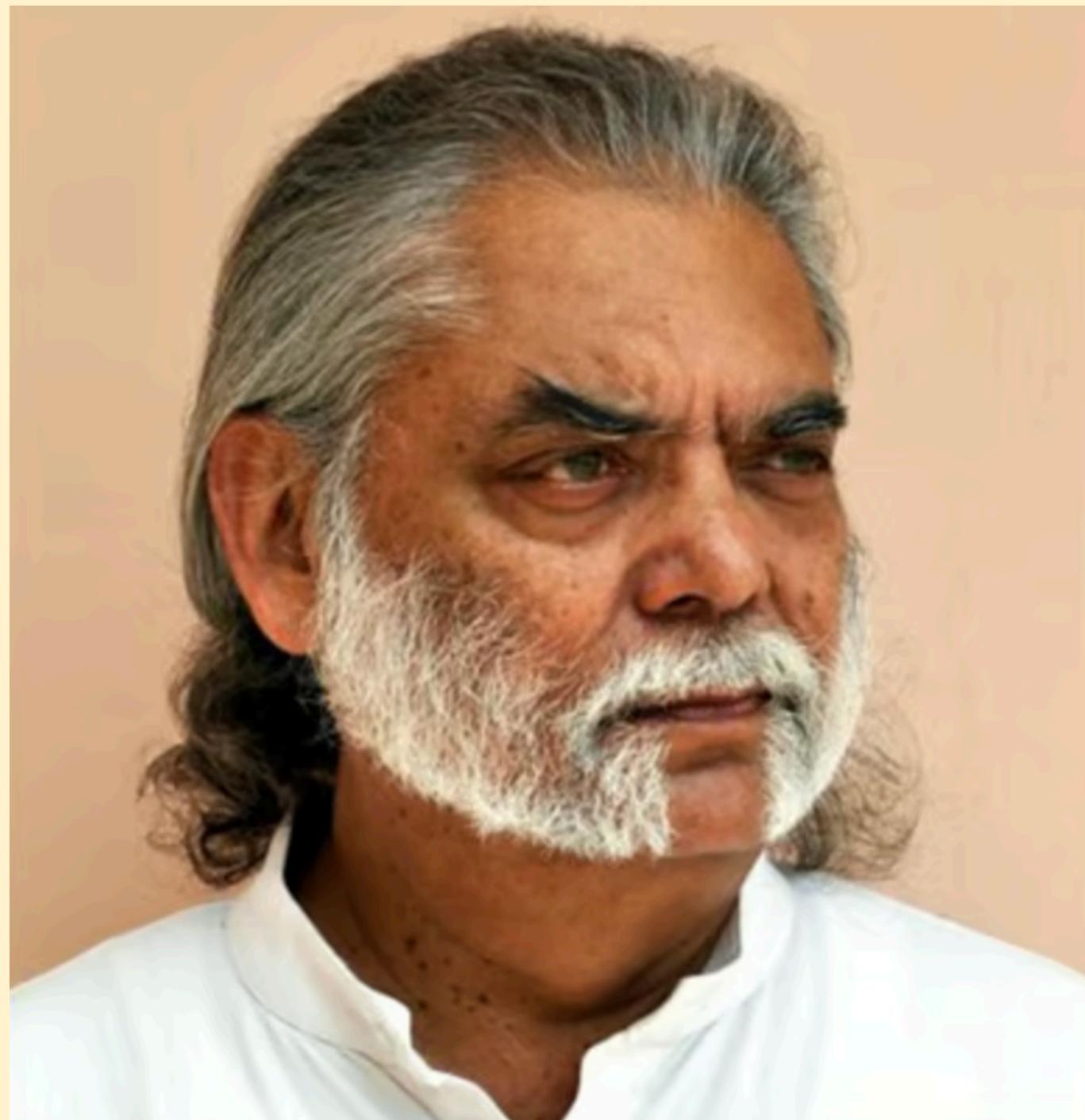
S.No.	Name	Group	Portal Link
3582	GJ Biology NEET HW 8	GujaratStudents	<a href="#">🔗</a>
3581	GJ Maths JEE HW 7	GujaratStudents	<a href="#">🔗</a>
3580	TN 11 Chemistry Group 3 HW 22	TNStudents	<a href="#">🔗</a>
3579	TN 11 Chemistry Group 1 JEE HW 43	TNStudents	<a href="#">🔗</a>

*Futures Tool*

The Futures Tool interface includes social media icons for Facebook and Instagram. It has sections for 'College Predictor' and 'Scholarships'. The 'Exam Rank College Predictor' section contains dropdown menus for 'Select an exam' (set to 'NEET'), 'Select Category' (set to 'Select...'), and 'Select Round Number' (set to 'Select...').

Contributed by interns we found through the **Code for GovTech (C4GT)** program.

# Is Bold Action Irresponsible?



**Prof. Dinesh Mohan**  
Founder, Transportation  
Research and Injury Prevention  
Programme (TRIPP), IITD



*Rapid Public Transportation*

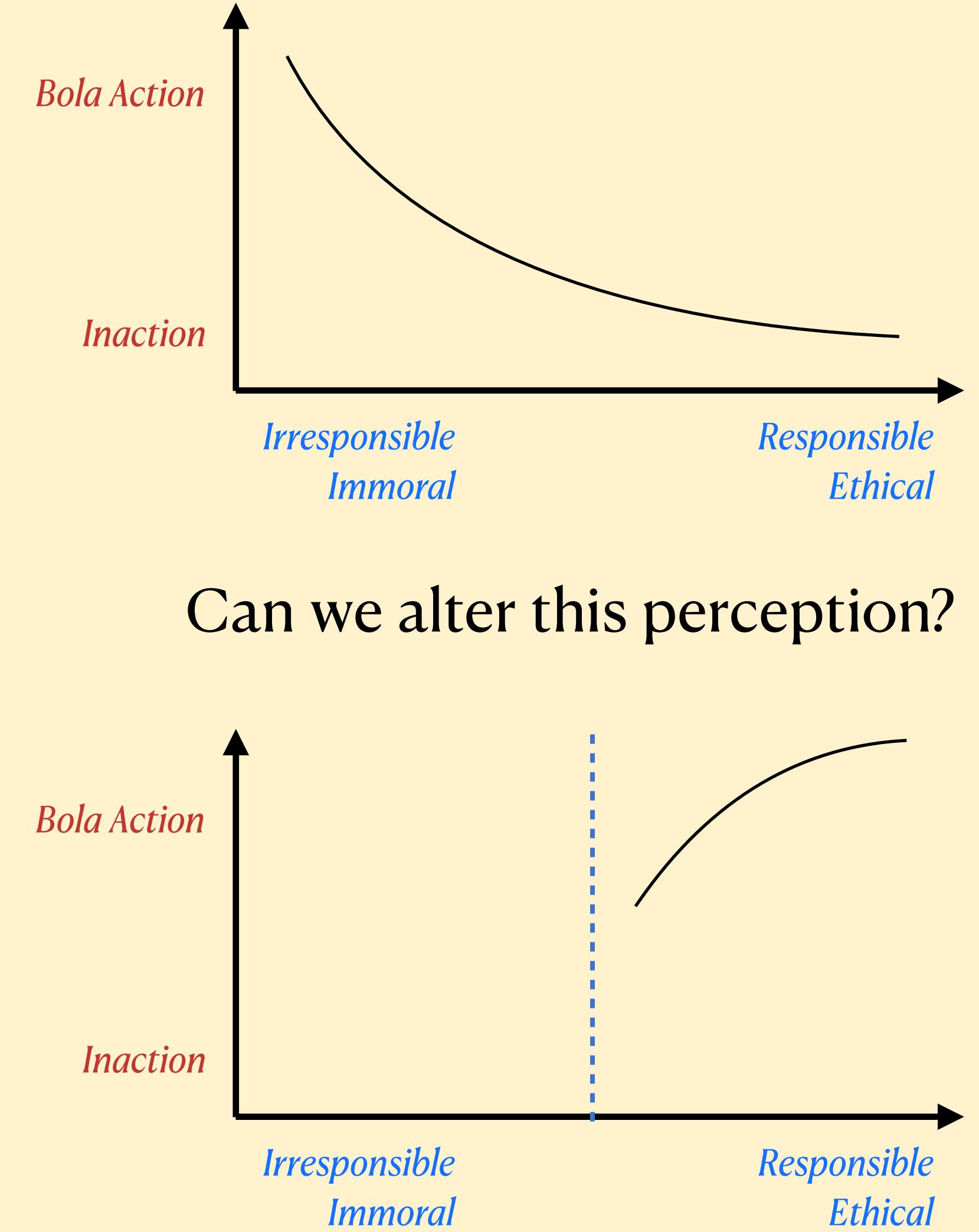
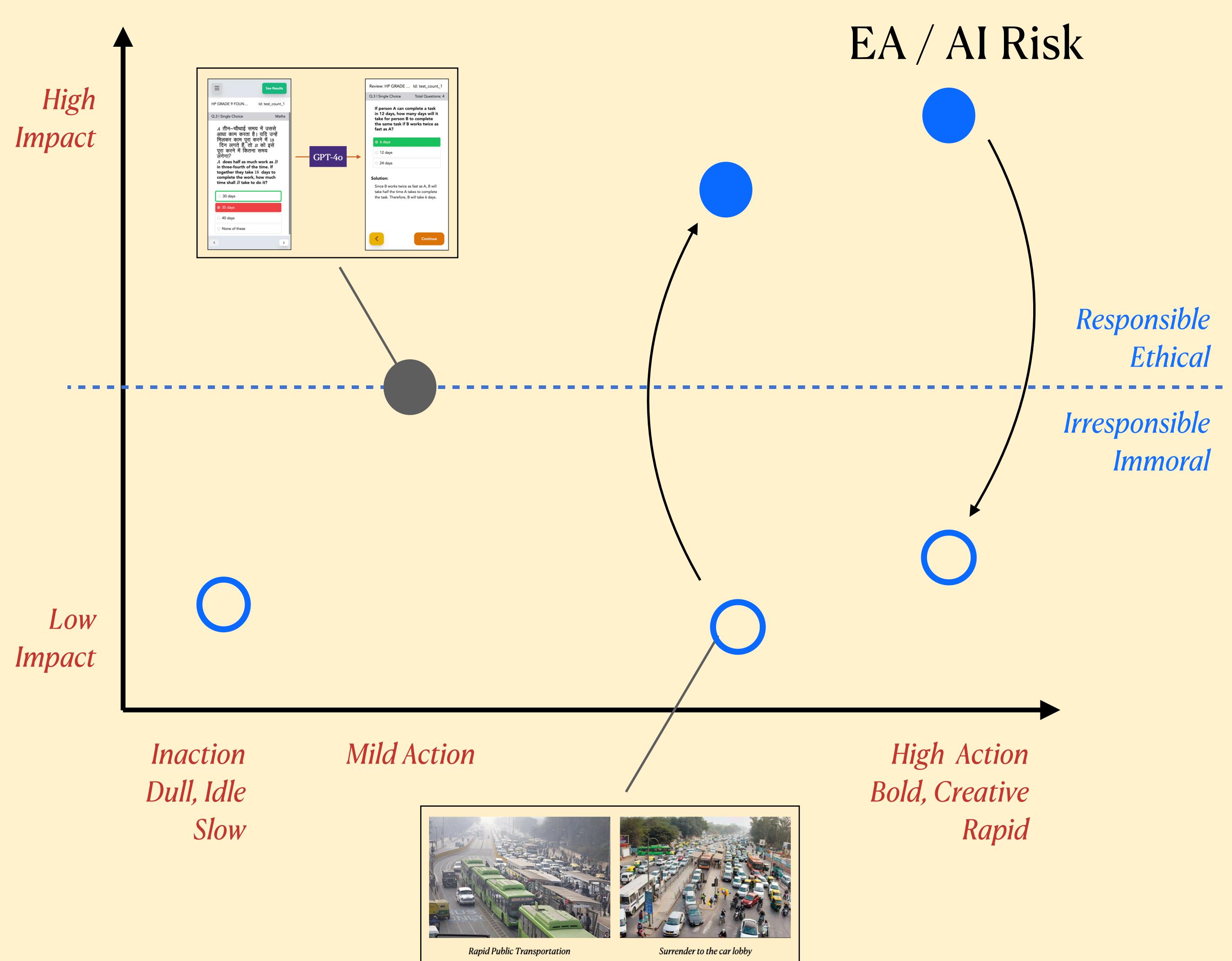


*Surrender to the car lobby*

Prof. Subhasis Banerjee - <https://thewire.in/urban/dinesh-mohan-obituary>

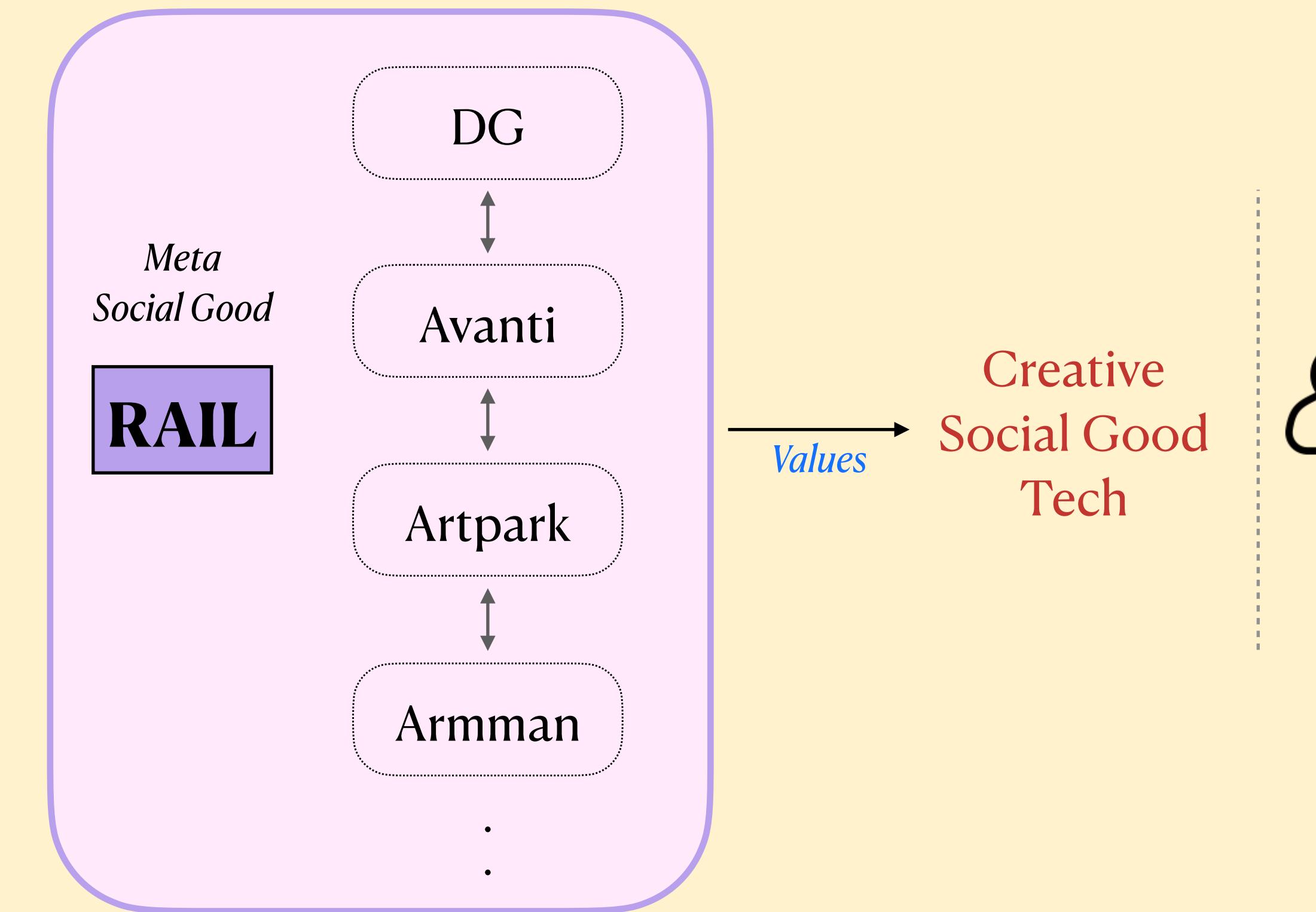
TIWARI, GEETAM. "Metro Rail and the City: Derailing Public Transport." *Economic and Political Weekly*, vol. 48, no. 48, 2013, pp. 65–76. JSTOR, <http://www.jstor.org/stable/23528925>. Accessed 26 Nov. 2024.

# Is Bold Action Irresponsible?



# Broad Questions

- (1) Does **impact** blur our sense of **responsibility**?
- (2) Are we too **critical**, pausing **action** unnecessarily?
- (3) Or too **hysterical**, rushing into AGI risk debates?
- (4) Is this **moral calculus** too nauseating for tech workers?



Hopefully, initiatives like **RAIL** can simplify this calculus and inspire bold, creative action.



# Thank You!



Slides available  
at [suryabulusu.github.io](https://suryabulusu.github.io)