



THE BOYS

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Understanding The Problem Statement



What we know

1. **High Accident Rate:** 67% of accidents involve the 18-45 age group.
2. **Education Gap:** Lack of comprehensive traffic rules education.
3. **Skills Stagnation:** No continuous training post-license acquisition.
4. **Disorganized Licensing Process:** Malpractices due to lack of structure.

01

Provide a **low-cost digital solution** to improve India's driving test/licensing system in the given situation and issues.

02

The solution should be **scalable** and **easy to operate** with minimum maintenance.



Driving test

Current Solution:

Reverse S

Assessing backward driving skills.

Traffic Junction

Handling intersections.

8 and H formation

Testing turning, control and precision in maneuvering

Overtaking

Evaluating Safe overtaking solutions

Parallel Park

Gauging parking skills

Automated Driving Testing Tracks (ADTTs)

ADTTs examine candidates on specific maneuvers within a fixed time frame

It's problems

1

Infrastructure and Equipment Issues of ADTT

2

Training of Instructors and Test Transparency

3

Accessibility and Availability and Language Barriers

4

Training of Instructors and Feedback Mechanism

PAIN POINTS



Prone to Malpractices and Corruption

Human Examiner Influence
Issue: Human examiners can be influenced by bribes or personal biases.

Lack of Driving Awareness and Skills Assessment

Incomplete Coverage
Issue: Tests do not cover all aspects like hazard perception, defensive driving, and road etiquette.

Basic Driving Test
Issue: Current driving tests are too basic.

Long Queues and Delays

Issue: Involvement of long queues and delays during the licensing process.

Inefficiency & Inconvenience

Multiple Visits to RTOs
Issue: Drivers must visit RTOs multiple times for application, payment, and tests.

Examiner Dependence

Issue: Lack of standardized testing procedures, leading to inconsistency.

Inconsistency and Lack of Transparency

Variation Across RTOs
Issue: Driving tests may vary in difficulty and standards across different RTOs.

A 5-FOLD SOLUTION

A Synchronous Solution

- Seamless integration and data synchronization **across all components** of the driving assessment process, including theoretical tests, simulator training, ADTTs, license issuance, and renewal.
- Utilize data analytics for **personalized training** and improvement recommendations.

Restructuring of Current Process

- A **3-step system** comprising Theoretical Driving Test, Simulator Training/Test, and ADTT.
- All managed through a unified application/network.
- Enhanced coverage of Theoretical test include domains such as cognitive and behavioural based situational test, on road awareness etc.

Simulator Test & Training

- Simulation of Virtual Environments and driving situations for **hazard perception and defensive driving training**.
- RTO office with simulator setups to facilitate practical training.
- Simulator data stored onto a centralized database allowing for personalized feedback and practice loops.

License Issuance and Renewal Process

- Automating and making the license issuance process more **robust to malpractices** by linking it to successful completion of all three required tests.
- A **7-day window** for test retakes upon failure.
- A **Periodic renewal system** for ADTT and simulator training to combat the stagnation of driving skills over time.

Revamping ADTTs with Cost-effective solution

- Replacing costly overhead cameras with **Aruco Markers and smartphone based accelerometer tracking** for behavior analysis during driving tests.
- Calibration exercises and checks ensuring accurate evaluation of driving skills and behaviors.



Automated Driving Test Tracks (ADTTs)

- Hazard Perception and defensive driving techniques cannot be taught /tested upon in the physical world due to their high-risk nature. Thus, a Simulated Virtual Environment is proposed to teach/test an individual for the same.
- Simulator Testing Process will majorly focus the testing of an individual for **hazardous and complex situations involving multi-agent traffic** on the road.
- This also facilitates testing of more relevant road situations like traffic on a roundabout, Maintaining speed and overtaking, Night driving, Emergency braking and handling etc.
- The simulator profiles will be made accessible to individuals to practice in the driving schools/centers with simulator setups to improve and understand the simulated situations.

Simulator Test and Training

- Conventional ADTTs use overhead cameras and sensory equipments to monitor a vehicle's trajectory and motion variables which ramp up the cost of ADTT setup, we solve this by use of **Aruco Markers and smartphone-based data collection**.
- The test track is to be covered with Aruco Markers at specified locations and optimal heights and the applicant is to **place the smartphone on the windshield** during the test.
- The application will use front camera feed, back camera feed, accelerometer and gyroscopic data from the smartphone to determine **motion variables relative trajectory of the vehicle by using Aruco markers**.
- Certain elaborate calibration tests ensure accurate data collection throughout the test.

Innovations



Personalized Learning by AI:-

faster skill development and better test readiness

Data Driven Insights

1

We analyze your performance across all assessments - theoretical test, simulator training, and practical driving test.

Real-time feedback:

3

During the practical test, an AI-powered system analyzes your driving in real-time, providing immediate feedback on your performance. This eliminates the need for separate evaluation teams and reduces manual processing costs.

Personalized learning plans

2

Based on the analysis, the system identifies specific areas for improvement and recommends:

- **Targeted simulator modules:** Focus on practicing weaker skills in a safe virtual environment.
- **Adaptive theoretical test questions:** Challenge them with questions tailored to their knowledge gaps, ensuring efficient learning.
- **Customized online resources:** Receive relevant learning materials to further strengthen their understanding of crucial topics.

Crowdsouce Hazard Perception Training:-

safer driving culture

Mobile app integration

1

These crowdsourced scenarios are then integrated into the simulator training, exposing users to a wider range of real-life situations beyond pre-programmed scenarios.

Enriched learning experience

3

This diverse exposure allows users to develop a deeper understanding of potential hazards and hone their hazard perception skills in a safe, virtual environment.

Real-world learning

2

A dedicated feature within the mobile app allows users to anonymously submit near-miss or challenging driving scenarios they encounter on the road.

Innovations

Incentivize Responsible Driving- safer driving culture

Partnering with Insurance Company

Collaborate with insurance companies to offer discounts or rewards for individuals who demonstrate responsible driving through simulator training completion during the practical test, encouraging participation and potentially offsetting some development costs.

Implement voluntary skills assessment

Allow licensed drivers to voluntarily undergo periodic skills assessment using the simulator or mobile application, providing data for further research and improvement of the system while offering individuals a chance to refresh their skills and potentially obtain discounts from insurance companies.

Efficiency

01

Standardized data collection and analysis: Ensure consistent data collection across all assessment components for accurate analysis and personalized learning.

02

Regular evaluation and feedback: Continuously monitor the system's effectiveness through user feedback and data analysis. Based on the findings, refine the solution to optimize efficiency and effectiveness.

03

Collaboration with stakeholders: Partner with government agencies, driving schools, and technology experts to leverage their expertise and ensure the solution aligns with regulations and practical needs.

04

Engage with the driving school community: Partner with driving schools to offer training on utilizing the simulator and mobile application, potentially creating a network of trainers who can further disseminate knowledge and contribute to the system's effectiveness.

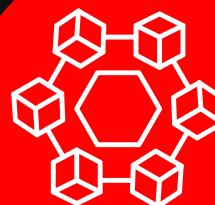


Scalability



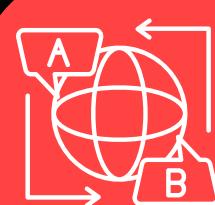
Cloud Based Platform

Elasticity: The platform can automatically scale its resources (storage, processing power) to meet fluctuating demand without significant additional infrastructure costs.



Modular Design

Selective Rollout: Specific components of the solution can be prioritized, allowing for a gradual introduction of elements while ensuring alignment of initial phases closely with regional needs and capacities.



Adaptability

Multilingual user interface: The application interface, training guides, test and training content can be translated into various regional languages allowing wider percolation into the current system.



Public-Private Partnerships

Government subsidies: Governments can provide financial support to driving schools and training institutions to implement the solution, making it more accessible to individuals.

Accessibility: The solution can be accessed from anywhere with an internet connection, eliminating geographical limitations.

Progressive Integration: Following the initial rollout, regions can gradually integrate additional components into the program. This promotes sustainable and effective long-term integration.

Flexibility: Testing parameters are set according to current Road safety Laws and can be centrally or region wise be modified to match future laws without any hinderance into the system.

Corporate social responsibility initiatives: Private companies can contribute to the implementation in specific regions, creating a shared responsibility model.

COST EFFECTIVENESS



-
- Utilize open-source software libraries and development frameworks wherever possible to reduce licensing costs.**
 - Leverage cloud-based platforms for data storage and processing, offering scalability and cost-efficiency compared to on-premise infrastructure.**
 - Implement the solution in phases, starting with core functionalities and gradually adding advanced features like AI and gamification to manage costs and ensure successful adoption**
 - Foster collaborations to develop cost-effective simulators by leveraging open-source software and readily available hardware like VR headsets.**
 - Design modular training content within the simulator that caters to different skill levels and specific needs, allowing for targeted practice and minimizing unnecessary training time.**

User-Friendly Operation



By prioritizing these aspects, the solution aims to create a user-friendly and accessible experience for all individuals, regardless of their technical background or location. This will encourage wider adoption and ensure everyone has the opportunity to benefit from the improved driver training and licensing system.

| Ease of Operation 1 | Intuitive Design 2 | Training Modules 3 |
|---|---|---|
| Simple and intuitive interface: The application interface will be designed with a clean, uncluttered layout and easy-to-understand navigation. | User-centered design principles: The user interface will be designed using user-centered principles, ensuring it is intuitive, consistent, and caters to the diverse needs of user groups. | Comprehensive video tutorials: User manuals and video tutorials will be readily accessible in the application and on the website to guide users through the entire process. |
| Minimal technical requirements: The system will be designed to function on a wide range of devices with minimal internet bandwidth requirements. | Visually appealing and culturally sensitive: The interface will be visually appealing and culturally sensitive, considering regional preferences in terms of colors, fonts, and icons. | Interactive training modules: Interactive modules will be created to familiarize users with the application's functionalities, incorporating practice questions, simulations, and feedback mechanisms to prepare them for tests. |
| Step-by-step guidance: Clear instructions and tutorials will be provided within the application to guide users through each stage of the process, from registration to taking the tests. | Multiple language support: As mentioned previously, the system will be available in multiple languages to ensure inclusivity. | Collaboration with driving schools: This can offer extra training opportunities, allowing individuals to learn about the application and comprehend the tests while providing practical guidance. |
| Offline functionality (optional): As mentioned earlier, exploring limited offline functionalities can cater to individuals in areas with unreliable internet access. | Accessibility features: Features like text-to-speech and screen readers will be incorporated to cater to users with disabilities. | |

Public Awareness & Adoption Strategy



Target Audiences

- Government Agencies:** Highlight the solution's ability to enhance road safety, reduce accidents, and generate revenue via efficient licensing procedures.
- Driving Schools:** Emphasize the advantages of enhanced training methods, standardized assessments, and the potential to attract new customers.
- General Public:** Raise awareness about the significance of proper training, showcase the benefits of the new system, and address concerns regarding cost and ease of use.

Publicity Channels

- Government Channels:** Promotion of the initiative through official government channels.
- Media Coverage:** Collaborations to create informative content about the solution and its benefits.
- Digital Marketing:** Utilize social media and targeted online advertising to reach a wider base.
- Community and Public Events:** Community events, road safety campaigns, and driving school workshops to directly interact with the people.

Messaging and Communication

- Benefit/Feature messaging:** Tangible benefits focused communication for each target audience. Highlighting aspects like improved road safety, reduced accidents, a transparent licensing process, etc.
- Simplified and Multilingual communication:** Developing communication/learning materials in various regional languages to ensure a wider reach to audience across diverse communities.
- Testimonials and user interviews:** Positive testimonials and informative videos about the new system to build trust and educate others.

Encouraging Adoption

- Incentives and rewards:** Incentive programs for initial inductions, such as discounts on car insurance or vehicular accessories etc.
- Phased rollout:** A phased rollout approach, starting with pilot programs in select regions, allowing refinement based on feedback.
- Collaboration with stakeholders:** Partner with key stakeholders to leverage their networks, expertise, and resources to facilitate widespread adoption.
- Monitoring and evaluation:** Monitoring the effectiveness and the implementation of the campaign. Analysis of data and feedback to refine the testing parameters



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Sabka **Saath**
Sabka **Vikas**
Sabka **Vishwas**
Sabka **Prayas**



Learning
Licence



Simulator

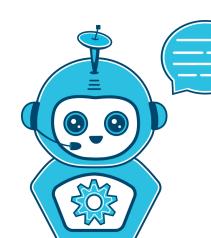


Slot
Booking



Other
Services

Test Results:
9/11





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Q5] You experience a tire blowout while driving. What's the safest course of action?

A) Slam on the brakes and come to a sudden stop.

B) Hold the steering wheel firmly and gradually slow down.

C) Swerve to avoid oncoming traffic.

00:16:23

1 2 3 4

5 6 7 8

9 10

● Answered ● Not Answered

● Current ● Not Visited

PREV

NEXT

REC



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Test Drive: 1

01:10:50

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