Proposal

For

State-Level Virtual Road Safety Training Platform

Kerala Development and Innovation Strategic Council

(K-DISC)

Contents

1.   Organization Profile-K-DISC

K-DISC is a strategic think-tank and advisory body constituted by the Government of Kerala. It aims at bringing out path-breaking strategic plans that reflect new directions in technology, product and process innovations, social shaping of technology, and creating a healthy and conducive ecosystem for fostering innovations in the State. In the sphere of development, K- DISC is promoting and initiating new projects in Emerging Technologies such as Blockchain, Internet of Things, Machine Learning, Artificial Intelligence, Robotics, and soon that would enable transparent and cognitive advances in various departments of the state Government and deliver the ultimate benefit to the citizens. K-DISC would facilitate different government departments that may need any of these technological advances to solve their critical problems and to arrive at the proof of concepts stage with adequate technical and financial resources to promote innovation. Also, K-DISC will ease the implementation by overseeing the same.

2.   Introduction

Providing road safety lessons and driving-related instructions to all parties involved is one of the primary responsibilities of the officers in the Motor Vehicles Department. Pre-licensing training is one of the essential objectives that all driver's license candidates must complete to respect the rules and regulations pertaining to traffic safety. Additional labor is also necessary to finish the paperwork and offer training. Each week, around 25000 applicants submit applications for learner's license. There is currently no reliable unified content delivery system. To conduct pre-license classes, learner's tests, and other training programs from a common center in an organized manner, it is proposed to create a virtual online platform that can accommodate 10,000 people. People can undergo a meaningful training experience using augmented reality or virtual reality. These environments go beyond simple document storage by including features like video conferencing, online chat rooms, online training, and the capacity to give examinations that are automatically assessed, like multiple-choice exams.

To complete the procedure for driving-related procedures, the citizen is currently making an extra effort. The platform promotes efficiency by enabling stakeholders to share information, data, and documents that are accessible to users anywhere. Users will be able to access the different data shared by the stakeholders regarding driving laws and license-related information. Links will also be available for registration and different classrooms for attending training programs.

3.   Need for the Project

Around 25000 candidates are enrolled for weekly pre-learners training across the state. The MVD assigns approximately 170 officials at 86 centres across the state to complete these training programs. Levels of understanding and engagement vary vastly with the candidates based on the category they belong to like school students, college students, online taxi operator, ambulance drivers, contract carriage drivers, hazard vehicle drivers,

bus drivers etc. Training content, methodology, duration etc. need to be different for each category. This results in undue stress on the department.

Training delivery system is not structured for today's scale of service, nor does it support incorporation of digital collaboration tools, essential for effective training.

In addition, MVD is incurring a significant amount of money on infrastructure for training because they do not have their own infrastructure in some of the places. MVD incurs a cost of approximately Rs.100 per head for training purposes (certificates, reference materials, stationary & refreshment items, and infrastructure).

Thus, there is a need for a unified digital platform for Motor Vehicle Department that brings all Driving License applicants together and provides proper road safety training, as well as streamlining the procedures for numerous registration processes associated with the license.

The platform may be used to provide training for high school and college students as well as faculty about the current traffic rules and guidelines governing the motor vehicles department. It takes a lot of effort to physically carry out such curriculum development projects.

The implementation of the aggregator policy necessitates extensive training for online taxi operators, which is practically hard to accomplish with existing personnel levels. Furthermore, policy details and training must be provided to a larger audience with limited resources.

There is a need for a platform for training department staff and other government employees about *parivahan* (The parivahan app is the one-stop shop created by the government of India for all things related to motor vehicles and transport in the country. The idea for the parivahan app is to centralize and digitize all information for car and other automobile owners) and to ensure that the content is distributed effectively and efficiently to reach the targeted possible audience. Mandatory training programs can be completed through a paid training program and generate additional revenue for the government in the future.

Experiential virtual learning environments are a key component in enabling users to participate in intensely interactive live classroom sessions. Majority of the targeted audience has now been experienced to the emerging technologies, and as a result, they will have technology-driven expectations for future training programs.

By implementing the virtual training platform, resources can be better utilized. Additional training courses can also be done as a paid training program that generates additional income for government.

4.   Project Objective

The objective of the project includes:

- To create a real-time collaboration, homogenous, unified digital platform that connects multiple stakeholders for a comprehensive range of online motor vehicle driving training using AR Technology
- Multiple classrooms with 30–40 participants each, each under the supervision of a single trainer, to effectively reach the intended target audience of nearly 10,000 at a time.
- To increase government revenue by incorporating paid training programs.

5.   Scope of Project

The scope of the pilot projects includes the following:

1. Web application
   a. Collaboration platform for different stakeholders
   b. Learners Management System
2. Mobile application for end users

5.1 Web application

The web application comprising the following functionalities will be developed which can be accessed by stakeholders, MVD and end users:

5.1.1   Collaboration platform for different stakeholders-Information centre

1. A real-time collaboration platform that connects multiple stakeholders with users for learners' training and other driving-related procedures across the state
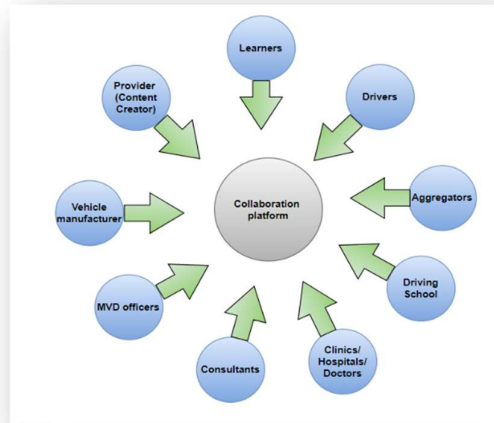
Fig 1: Collaboration Platform

- Stakeholders will have the following functionalities in the Information Centre:
  - Stakeholders can login to the application with the registration number provided by the MVD

  - Will be able to upload audio files, text files, pdfs, video files, image files, etc. with the approval of admin /MVD
  - Will be able to add the services they provide with all relevant information like location, amount etc.
- End users will be able to access the data from the stakeholders in the information centre where:
  - Users can rate the stakeholders as per their experience
  - Users can a book the appointment of the stakeholders for license-related queries and documents

5.1.2   Learning management system

The platform should provide virtual classrooms that can be created from scratch and customized to suit the needs of an admin, who can then invite stakeholders to join.

In the virtual classroom, the following key features shall be incorporated for the interactive participation of all stakeholders:

- Admin shall be able to create and maintain virtual classrooms for various subjects.
- Instructors can choose virtual classrooms to run their classes from and announce as well as invite pre-registered candidates.
- Candidates can attend pre-registered courses by invitation or by "free walk-in" if permitted.
- Instructors & trainers shall have the rights to upload videos, presentation materials, digital board facilities, etc on to the respective video walls of the virtual classrooms.

- The number of participants that can be accommodated in a single session across multiple virtual classrooms shall be close to 10,000 so that we can provide a uniform and efficient manner of delivering material to a broader audience in less time
- Trainers from the Department will provide the online training via video conferencing, pre-recorded sessions, and scheduled presentations on this platform
- Separate meeting rooms can be set up for group discussions via Videoconferencing to be administered by Trainers.
- Chat features like one on-one and group chats shall be supported
- Participation controls so that students can "raise their hands" in case of any queries or otherwise participate in lessons
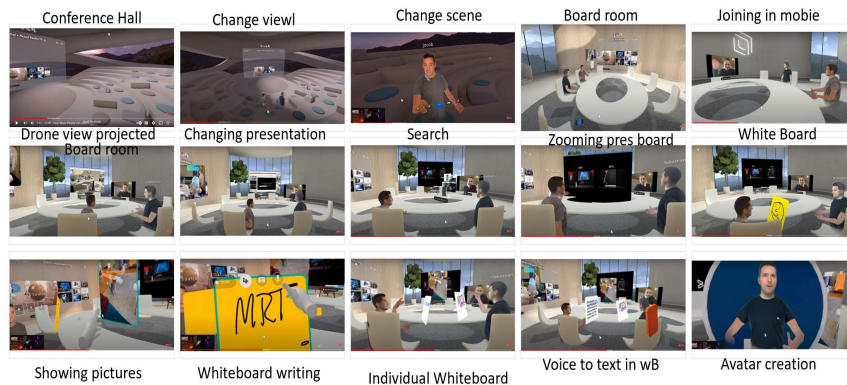
Fig. 2: Classroom Selection

In the learner management module, the needs of the candidates/participants are addressed, as follows:

1. Candidates can log in to the platform by signing up with his/her credentials.
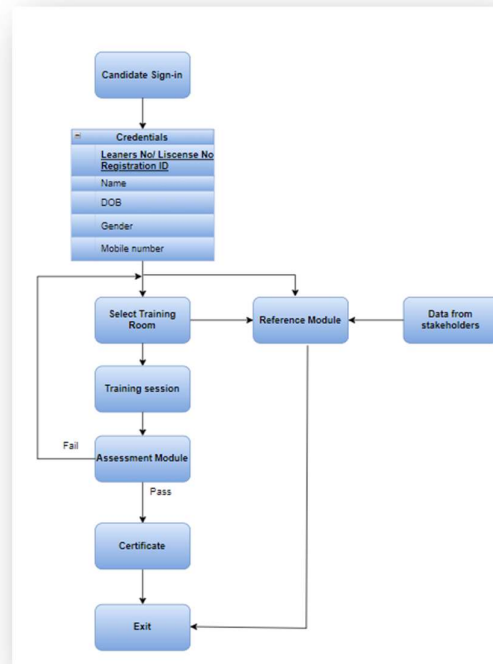
Fig 3: Candidate Log-in

2. Candidate can access the Reference module, Training module, and Assessment module through the platform
3. After the training, the candidate will be evaluated to confirm his or her attentiveness
4. Verify participants' identities by snapping their photos automatically, which can then be included in the pre-requisite certificate
5. Voice search will be enabled to assist candidates in navigating the application
6. To make the content more engaging and enjoyable, it will be delivered in 3D video format

5.1.2.1 Reference module

A reference module will be provided to candidates as a supplementary module for obtaining content for exam preparation as below:

     a. Driving regulation 2017 rule book
     b. Online tutorial class
     c. Learner's study material
     d. Driving manual
     e. Traffic signal manual

The Reference module will support:

1. A notice board with links to several registration and renewal processes. Eg: Licence renewal

2. Reference materials will be available in two languages: Malayalam and English. Materials will be provided by the Department
3. The trainer/ admin will be able to upload, edit, and delete audio files., text files, pdfs, video files, face-to-face courses, image files, etc.
4. Candidates will have a reference module as a supplementary module for obtaining content for exam preparation, as well as notifications and other data from other stakeholders such as driving schools, consultants, and so on
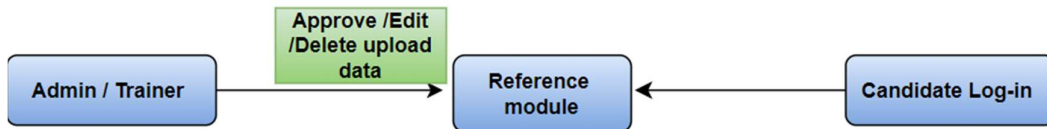

Fig 4: Reference Module

5.1.2.2 Training module

The platform should support blended learning, which incorporates elements of instructor-led training, classroom, seminar, or conference-based learning, self-paced online courses, and documents accessible through the reference module.

Training Module contains following features:

1. The participant can access the training program via mobile or PC
2. The meeting link or QR code can be shared via newspaper or social media, or it can be viewed as a notification in the reference module
3. Participants who enter the platform can select the room where the training program to which they have been invited is sited
4. Participants could access the reference module while they are in the training module
5. Both prerecorded sessions and video conferencing will be used to deliver the training
6. There will be a personal notepad for taking notes during the training program.
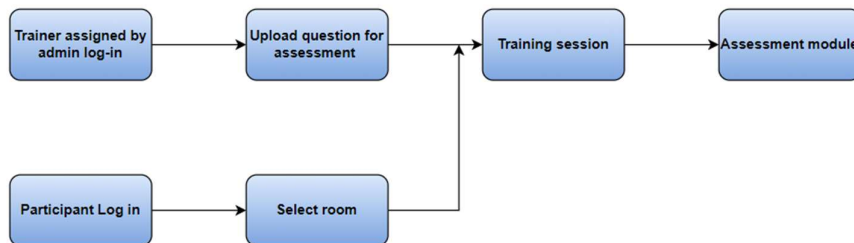7. Trainers can display PPTs and videos on the screen

Fig 5: Training Module

Sl. No.	Types of training	Frequency of training	Duration	Contents
1	Pre- leaners training	Weekly	2 hours	-Road rules
				-Road Signs
				-Road Regulations
				-Parking Errors
				-Know your road
				- vehicle control
2	School-based training program	Monthly	2 hours	-Laws of juvenal driving
				-Pedestrian rules
				-Usage of bicycles
				-Behaviour training
				-Junction management
				-Causes of accident
				-Accident statistics
				-Vehicle dynamics
3	Drivers Training program	Weekly	2 hours	-Rules for drivers of vehicles (carrying Hazardous Goods, stage carriers, cab taxi drivers, school bus drivers, ambulance drivers)
				-Crash Prevention Course
				-Firefighting training
4	Corrective training Program	Weekly	2 hours	-Crash Prevention Course
				-Road rules and regulations
				-Usage of protective gear
				- Laws of unsafe driving
				- Counselling session
				- Evaluation of vehicles and roads
				- Offences and penalties
				-active and passive safety
				-things to do in case of an accident
				-control of traffic
				- lane selection and lane discipline
5	Faculty development program	Weekly	3 hours	- Drill practice session, for schoolteachers
				- Responsibility for school management and teachers on a bus trip
				- analysing students' behaviors
6	Curriculum development			
Paid training programs				
7	Aggregator training programs	Monthly		- New policy training can be done
8	Corporate training programs	Monthly		-Training for fleet owners -Training for college students

Learning content

Delivering eLearning content through the platform gives the opportunity to create a positive impact on the learner experience. When creating eLearning content there are several ways to keep learners engaged, as we can create and deliver several different types of eLearning content.

It's important to choose the media that will convey the idea the simplest yet most effectively. Whether choosing to add an image, audio, or video to help emphasize or reinforce a point can impact how the learner experiences the content.

Different types of eLearning content are:

1. Slide-based courses

Slide-based courses are what most people think of first when they hear 'eLearning'. They involve the user taking a self-paced course where learners view slides with interactive units and possibly narration and other multimedia elements. Such courses often have a look and feel like PowerPoint presentations.

2. Training videos

Video content is more popular than ever, and with good reason – it's always more engaging than text or pictures alone. There are several ways to use video content in eLearning: Augmented reality videos are very effective and powerful when communicating to any audience. Augmented reality, AR, brings an interactive experience of the physical world where objects in the real world are enhanced by computer-generated perceptual information. This compelling digital feature brings content to life, making the video exciting, engaging, and entertaining.

3. Standalone training videos

Can use video as the only type of content. For example, could record a series of videos on rules and regulations like speaking in meetings.

4. Embedded videos

Can embed videos in an eLearning course. The video could be content created by yourself, public domain, or stock footage. The nice thing about this approach is that one can use video for certain topics and mix up more interactive elements within the course.

5. Webinar or live training playback

This method is simply providing recordings of previous live or virtual classroom training and making them available online platform. This is a great and inexpensive way to incorporate video into your eLearning content.

6. Presenter screencasts

These feature the screen and video from the webcam simultaneously.

7. Podcasts

Podcasts have risen in popularity to become a mainstream form of media familiar to just about everyone. They are already used in various spheres of business, so organizations have also started using them as convenient tool for learning and development.

Podcasts are great for non-assessable training, particularly skills that revolve around mindset, motivation, and other soft skills. They can also be useful for presenting longer format use cases and scenarios in the form of 'stories' that would be way too long to present in, say, a dialog simulation.

8. E-books

This type of eLearning content is not seen as often as the others mentioned, but it's a very quick and easy way to share things like standard operating procedures, step-by-step processes, and other manuals, and provides a good reading experience.

5.1.2.3 Assessment module
Features of the assessment modules are as follows:

1. After completing the training, participants will be assessed with a series of questions that can be answered online from multiple-choice questions. If the participant passes the test, a digitally signed certificate will be awarded which can be downloaded. If failed, the participant must attend the training again.
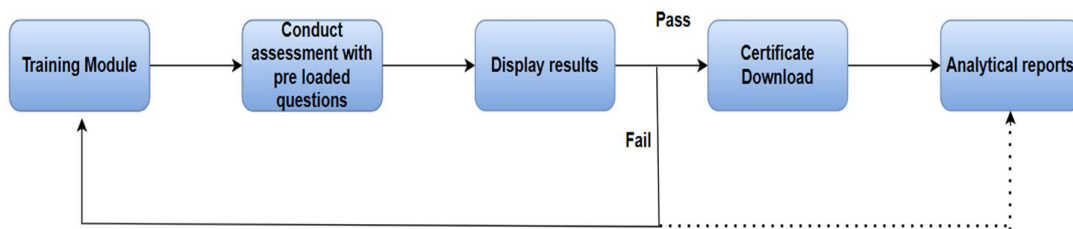2. The department can access the analytical Reports to track attendance, Pass %, user-level analysis, etc.

Fig 6: Assessment Module

Assessment & Live Feedback.

Assessment helps to determine a learner's knowledge and skills, including learning gaps as they progress through an eLearning course. This assessment might take the form of a quiz or short exercise at the end of a particular unit or module within the course. As this type of assessment takes place during the learning process, it does not require the instructor to provide a mark or grade for the learner's achievement. Instructors may decide whether to provide a simple pass/fail or more detailed feedback.

Feedback can be provided to learners either after manual correction by an instructor or in real-time on completion of an assessment by displaying the results of an auto-correction on screen in the Learner management. This on-screen feedback can simply identify whether the learner's answer was correct or incorrect. It can also support formative assessment by providing the reason why the answer was correct, and in the case of an incorrect answer, explaining the reasoning for the correct answer. This type of formative feedback helps to reinforce learning during the assessment process.

Feedback can also be provided less formally in real-time from instructors and the learner's peers through discussion groups linked to the course. It will offer another opportunity for the learner to engage with the association community, and to learn from the experience and perspectives of others, enriching the overall learning experience.

Reporting and Data Analysis.

This includes eLearning analytic tools. Instructors and administrators must be able to view and track online training initiatives to determine if they are effective or need adjusting. This can be applied to groups of learners and individuals.

Data visualization tools help to analyze and interpret the data that is generated by the platform. Tracking completion data, compliance adherence, engagement metrics, capability assessments, learning updates, etc. we can customize and filter these visualizations to identify content, training, teams, or even individuals in a matter of seconds.

5.2 Mobile application

The mobile application will include all the relevant functionalities from the web platforms for end users :
- Registration for Candidates
- Users/candidates will have the following functionalities:
  - Will be able to find nearby stakeholders like eye hospitals, pollution testing centres, auto consultants, etc., and also, can rate the stakeholders as per their experience in the Information Centre.
  - View the analytics in the dashboard which shows their courses are done and assessment feedback and can access the reference module for getting the reference materials in the LMS module
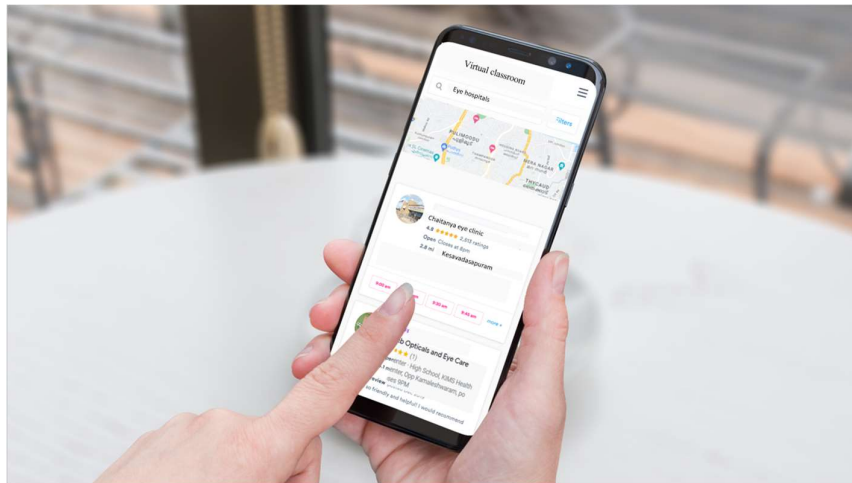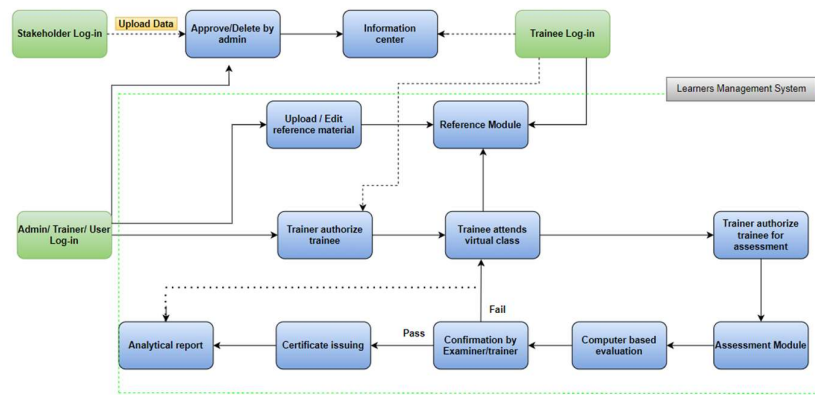

Fig 7: Mobile app

5.3 Process Flow

Fig 7: Process flow

6.   Deliverables

Following modules will be delivered as a part of the project:

1. A web-based collaboration system
2. Mobile Application

7.   Key Benefits

The Key benefits envisaged include:

1. Effective and efficient delivery of road safety rules ensuring maximum reach to the public.
2. Proper learner's license classes and tests without any queue or interruptions.
3. Regular road safety training programs and classes to students and others through this platform from a common center in a unified manner.
4. Augmented reality will create a buzz and get people excited to use the technology and participate in the development program.
5. Platform for collaboration that streamlines license-related procedures.
6. Paid training programs will generate additional revenue for the government.
7. It is understood from MVD that approximately Rs. 100 is being spent on each candidate towards training expenses. Considering 1,00,000 candidates each month, there is an expenditure of Rs. 12Cr annually by the department for conducting various training programs. With the implementation of the Virtual Road Safety Training Platform, Rs. 12 crores would be an enormous saving for the Motor Vehicles Department.

8.   Conclusion

Motor Vehicle Department (MVD) can effectively and efficiently deliver training programs for road safety rules and regulations while guaranteeing maximum public reach from a central hub of MVD. Also, a real-time collaboration, homogenous, across the state platform that connects multiple stakeholders for a comprehensive range of online/offline motor vehicle driving training using AR Technology can be achieved by implementing this project.