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Q-1. How does Techno Impressions integrate artificial intelligence and robotics into its current product portfolio to address market needs?

Ans. Techno Impressions Private Limited, based in Kochi, Kerala, integrates artificial intelligence (AI) and robotics into its product portfolio primarily to enhance road safety and offer automation solutions across various industries. Our core mission revolves around developing products that benefit society, leveraging advanced technologies to address specific market needs.

How do we achieve this:

AI and Robotics for Enhanced Road Safety. The flagship product demonstrating our AI and robotics integration is "enso," an Intelligent Headlight Beam Management Assist. Or simply called as Intelligent Beam Assist, a standalone, active automotive safety solution. enso utilizes AI reasoning to intelligently manage vehicle headlights beams. It assesses various parameters in real-time. It can be activated in simple operating procedures, turning the combination switch to ON position and keeping the combination switch on Low Beam position (default).

enso will automatically select the right beam at the right speed and at the right moment. Enhancing the user driver vision without tampering the vision of the opposite approaching driver. It enhances the road safety standards and intended to reduce night driving accidents caused due to irrational selection of beams.

Road Safety and the Critical Role of Headlight Beam Selection in India

Road safety in India remains a major concern, with an alarmingly high number of accidents resulting in fatalities and injuries. Among the many contributing factors, one often overlooked yet critical issue is the irrational and improper use of automotive headlight beams. What appears to be a minor oversight can turn a vehicle's

primary illumination system from a safety tool into a serious hazard.

Headlights are designed to provide adequate visibility for the driver and ensure that the vehicle is visible to others. Modern vehicles typically feature two main beam settings: low beam and high beam. Low beams are ideal for urban areas, oncoming traffic, or when following another vehicle, as they provide sufficient illumination without blinding others. High beams are intended for poorly lit rural roads or highways with no oncoming traffic, offering extended forward visibility.

However, in India, improper usage of these beams is rampant. The indiscriminate use of high beams, particularly in well-lit urban areas or when approaching other vehicles, creates intense glare that temporarily blinds oncoming drivers. This momentary "whiteout" or retinal bleach effect can drastically impair vision, especially in drivers with lifestyle-related health conditions. The result: head-on collisions, rear-end crashes, or vehicles veering off the road—especially on undivided highways and narrow lanes.

Conversely, using low beams on unlit roads where high beams are necessary can also be dangerous. Inadequate illumination limits the driver's ability to detect hazards such as potholes, pedestrians, stray animals, or stalled vehicles. In rural areas at night, this lack of visibility can prove catastrophic.

While public awareness campaigns by authorities and NGOs aim to educate drivers about proper headlight usage, many drivers ignore these guidelines due to fatigue, misinformation, or a lack of driving etiquette. Moreover, frustration from the non-reciprocal courtesy of others not dimming their headlights often discourages drivers from following best practices themselves.

The Solution: Intelligent Beam Assist (IBA)

These critical issues can be effectively addressed with the implementation of an Automatic Intelligent Beam Management Assist (IBA)—a standalone, active safety device developed by Techno Impressions, Kochi. Tested and validated by ICAT & ERTL, IBA assists drivers in selecting the correct beam based on real-time road conditions, ambient light, vehicle speed, and oncoming traffic—ensuring compliance with Indian driving laws and engineering principles.

Q-2. How does Techno Impressions balance investments between R&D, manufacturing, and marketing to drive sustainable growth?

Ans. Techno Impressions Private Limited, with its focus on advanced technology products like the "enso" Intelligent Beam Management Assist, employs several strategies to ensure the scalability and manufacturability of its offerings for both domestic and international markets.

We explicitly state its involvement in "Research and Development, Manufacturing, Marketing and Training." This holistic approach suggests that manufacturability is considered from the very early stages of product design. By having R&D and manufacturing intertwined, we can design products that are inherently easier and more cost-effective to produce at scale. For manufacturing, depends on quantity and time for delivery we associate with expert manufacturing outsourcing partners with fully automated systems to produce PCBs under electronic manufacturing services.

Universal Compatibility (enso): The "enso" device is designed to be "Universal model compatible to headlamp circuit of any four wheeler" and works with "12 volt and 24volt DC systems." This broad compatibility simplifies inventory, manufacturing, and distribution, as a single product can serve a wide range of vehicles, contributing directly to scalability.

Non-Invasive Installation: The product "can be readily installed in the vehicle without tampering with the existing wiring harness of the vehicle." This "plug-and-play" aspect reduces installation complexity and time, making it attractive for large-scale adoption and easier for distributors and installers, both domestically and internationally. This directly impacts how quickly and widely the product can be deployed.

Marketing – Mostly our product is served as OE for vehicle manufactures.

Industry Mandate – Enabling Compliance with DGMS Regulations

With Auto Dipper systems now mandated by the Director General of Mines Safety (DGMS), the need for reliable, advanced headlight automation is more critical than ever.

Enso meets and exceeds these regulatory requirements, positioning itself as the preferred choice in mining and heavy equipment sectors.

Trusted by Industry Leaders – OE in SANY & XCMG

Our product has been chosen as Original Equipment (OE) by leading manufacturers such as SANY Heavy Equipment and XCMG, reinforcing its superior performance and reliability in harsh, demanding environments.

These partnerships underscore the technical edge and market confidence in our solution.

Q-3. What is your vision for Techno Impressions' role in shaping the future of smart devices and connected technologies in India and beyond?

Ans. Our Vision: Leading the Future of Intelligent Mobility and Connected Safety

At Techno Impressions, we envision a future where intelligent devices seamlessly integrate into every vehicle, transforming safety from a reactive measure to a proactive, connected experience—not just in India, but across global markets.

We aim to be a catalyst in the evolution of smart mobility, focusing on:

Advanced Safety Automation

Developing intelligent, adaptive systems like Enso that reduce human error, comply with regulations, and protect lives in real-world conditions—from national highways to remote mining sites.

Universal Compatibility & Scalability

Designing plug-and-play, universally compatible products that simplify adoption across diverse vehicle platforms, enabling mass deployment at scale—both for OEMs and the aftermarket.

Connected Ecosystems

Building toward a future where our devices form part of a broader network of connected technologies, sharing data in real time to support smart infrastructure, fleet analytics, and predictive safety.

Made for India, Built for the World

We innovate with India's unique challenges in mind—unlit roads, high-density traffic, and evolving regulations—yet engineer our solutions to global standards, making them viable across continents.

Partnership-Driven Growth

Collaborating with OEMs, fleet operators, public safety agencies, and regulatory bodies to shape policy, standardize innovation, and build a smarter, safer transportation future - together.