Little human touch in modern car industry

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Automotive innovation is heavily dependent on artificial intelligence (AI), particularly in autonomous driving, diagnostics and infotainment. This transformation challenges existing IP frameworks. Three key legal issues in AI-driven automotive software are invention, patentability and licensing.

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The automotive industry is shifting from hardware-driven engineering to software-centric innovation. With electric vehicles (EVs), connected ecosystems and autonomous systems, AI is now embedded in many critical vehicle functions. Tesla's Autopilot, Waymo's autonomous rides and Mercedes-Benz's Drive Pilot show how AI is redefining mobility. As AI-generated content is integrated into vehicle systems, determining what constitutes protectable IP and who is the rightful inventor becomes difficult.

The most contentious issue is whether AI can be an inventor. India, the US and the EU, require patent applicants to be natural persons. Courts refuse to recognise AI systems as inventors, relying on section 2(y) of the Indian Patents Act, 1970. AI models may generate innovative solutions without direct human input. Deep learning tools may independently optimise driving decisions or structural design. However, in law these outputs must be attributed to a human.

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The global Dabus case, in which an AI system was listed as the sole inventor, sparked debate about “augmented inventorship”. This proposes that human and machine contributions are acknowledged jointly. Companies such as Mahindra & Mahindra using generative AI in design and robotic maintenance must at present ensure that patent applications attribute innovations to human engineers who supervise and validate AI suggestions.

Patentability of AI-driven automotive software is limited by section 3(k) of the Patents Act, 1970 that excludes “computer programs per se”. Applications must demonstrate a “technical effect” or integration with hardware to overcome this barrier. Software must not only solve an abstract problem but also produce a tangible result that improves vehicle safety, efficiency or user functionality. Complete technical disclosure and clearly articulated inventive steps are crucial.

Many companies adopt hybrid IP strategies. Tata Motors’ acti.ev platform integrates AI in adaptive climate control and over-the-air updates. Although some may be patentable, core machine learning algorithms are better protected as trade secrets, governed by confidentiality agreements and internal controls. Companies such as Bosch and Nvidia use layered protection, patenting hardware-integrated AI functions while safeguarding proprietary software as trade secrets. This reduces IP risks while maximising commercial advantage.

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Licensing has become central to IP governance in automotive AI. Modern vehicles depend on layered software stacks, often comprising proprietary, open-source and third-party modules. Each component may be governed by licences to use MIT, Apache, or GPL, each imposing specific obligations. If not managed competently, open-source licences may force companies to disclose modified code, risking proprietary IP. Robust licensing compliance protocols are critical.

Maruti Suzuki's AI-powered Virtual Sales Avatar, which has processed more than 18 million interactions, relies on third-party AI tools and natural language processing frameworks. Maruti's investment in Amlgo Labs, a data analytics firm, highlights the importance of clear IP ownership clauses in collaboration agreements, particularly relating to algorithmic outputs and data usage rights. Software audits, tracking of licence obligations and tailored agreements covering usage rights, derivative works and indemnity clauses should be considered.

As India's automotive industry embraces intelligent mobility, IP regimes must adapt. Inventor doctrines, patent eligibility criteria and licensing frameworks must evolve to reflect collaborative, data-driven innovation.

Companies such as Tata Motors, Mahindra & Mahindra and Maruti Suzuki can lead in building a forward-looking IP ecosystem that balances innovation with legal certainty. Legal professionals play a proactive role, crafting robust IP strategies, advising on licensing compliance and facilitating responsible data governance. They ensure that AI-driven automotive software is not only a technological leap, but also a legally secure one.

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