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AUTONOMOUS VEHICLES: LEGAL INTRICACIES AND FUTURE

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Abstract

Artificial intelligence (AI) is emerging as one of the developing fields that are altering the transportation business, its management mechanisms and associated frameworks. The concept of AI was first discussed in 1950 by Alan Turing in his seminal paper "Computing Machinery and Intelligence". Since its origination, AI has gone through several trials and tribulations, leading to major technological advancements all over the globe and moving towards solution of growing transportation sector. It is becoming immensely useful in the design and management of a long-term transportation system in improving decision-making efficiency and resource allocation. AI in transportation is arguably one of the most fascinating concepts. However, it also covers some controversial aspects which have divided public opinion in the past between those who viewed it as a miracle and those who saw it as harmful and dangerous. The AI-based transportation system is not widely used in India yet, but it has a lot of room to grow and expand. On these lines, the study will attempt to analyze the responsibility gap in the Indian legal system with respect to autonomous vehicles. A comprehensive analysis of the current legal framework of India reveals a wide gap that needs to be filled by necessary amendments. The study will try to provide a solution-based analysis of various challenges related to autonomous vehicles, such as automobile insurance, privacy issues, and data protection. The current legal framework governing the automobile insurance system in India will be scrutinized with reference to autonomous vehicles. Additionally, the present study also seeks to take into account the legal aspects of data protection and privacy issues concerning the operation of autonomous vehicles in India.

Keywords

Autonomous Vehicles, Services, Privacy, Legal-Framework, Legal Status, Insurance Law, Driving License, Data Protection Law, Privacy.

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Introduction

In the early days of the development of the civilization human beings always travel for food and later started to use animals. Evolution of fire and wheel has given them the opportunity to think for more tools of transportation. On the way of continuous development they achieved their target and started using the cart and animals. Starting of the economic activities, export and import of goods, requirement of goods carriages and allied services had become necessary requirements. After a long travel through centuries of development, now we are at the age of smart transportation. After successful trials in airways, railways and waterways we have also achieved certain goals in road transportation in the form of driverless vehicles. Basically these types of advances vehicles derive support from various service supplementing the Artificial Intelligence device and with combination of global position devices. In traditional kinds of vehicle (human-driven) the terms and conditions for automobile insurance are different from driverless vehicle. Another issue is about the data, its protection and privacy laws. Therefore, this paper covers all the issues from legal aspect.

The evolution of fire to wheel is the best illustration of the expression "necessity is the mother of invention". Many things and occurrences have been made and discovered by man to make his existence easier and more comfortable. Humans used to travel by foot before developing vehicles, and then they began to use animals for transportation. The creation of modern transportation systems was sparked by the first industrial revolution.[1] Not only may the fourth industrial revolution change our conceptions of what is conceivable, but it can also change how society functions. It will, in some ways, be a synthesis of the second and third industrial revolutions, which gave us mechanised transportation and the internet in its current form. Keeping this in mind, transportation is the sector with the most potential for innovation

[1] All Answers ltd, *How did Transportation Change During the Industrial Revolution?*, UKESSAYS (February 2022), https://www.ukessays.com/essays/history/how-did-transportation-change-during-the-industrial-revolution.php?vref=1 (last visited Dec. 5, 2022).

and transformation. Any technology must have a robust legal framework to attain its full potential because it performs the dual roles of setting the bounds for future research and directing research in such a manner that it acts as a force multiplier without choking future research. The lack of an efficient legal framework is a hurdle not just for legislators, but also for companies and individuals undertaking research, as they are unaware of the boundaries and how to forward research organically.

Artificial intelligence (AI) is a vast field of computer science that aims to make machines work like a human brain and enable them to execute human-like cognitive processes. Alan Turing, a famous English mathematician, discussed this topic for the first time in his seminal paper "Computing Machinery and Intelligence"[2], published in 1950.AI can also be described as a machine's ability to conduct human-like cognitive functions. John McCarthy, a computer scientist, coined the term AI in 1956 at the Dartmouth Conference, and is hence known as the Father of AI.[3]

The majority of large cities have transportation, traffic, and logistics challenges around the world. This is due to both the rapidly growing human population and the growing number of cars on the road.[4] The AI-based technology could be immensely useful in the design and management of a long-term transportation system. Transportation is one of the industries where AI is getting momentum. To improve decision-making efficiency and resource allocation, AI systems can recognise patterns in vast datasets and simulate sophisticated procedures.[5] The major changes in the sector will be the deployment and adoption of highly autonomous vehicles, as well as improved traffic control systems.

The study will look into the responsibility gap in India's legal system when it comes to self-driving cars. The study will also look into India's current legal framework for governing autonomous vehicles and related problems, as well as the country's motor insurance system in relation to autonomous vehicles. Furthermore, the study aims to consider data protection and privacy issues related to the operation of autonomous vehicles. A comprehensive analysis of the current legal framework of India reveals a wide gap that needs to be filled by necessary amendments. The study will try to provide a solution-based analysis of various challenges related to autonomous vehicles, such as automobile insurance, privacy issues, and data protection. The current legal framework governing the automobile insurance system in India will be scrutinized with reference to autonomous vehicles. Additionally, the said study also seeks to take into account the legal aspects of data protection and privacy issues concerning the operation of autonomous vehicles in India.

Status of Autonomous Vehicles

Driverless vehicles, also known as autonomous, driverless, self-driving, and robotic vehicles, are automobiles that are capable of perceiving their surroundings and driving without the assistance of a human driver, thereby completing the functions of a regular vehicle.[6] The

[2] A.M. Turing, *Computing Machinery and Intelligence*, 59 MIND A QUATERLY REVIEW OF PSYCHOLOGY AND PHILOSOPHY 433, (October 1950).

[3] Yanyan Dong, JieHou, *at. al.*,"Research on How Human Intelligence, Consciousness, and Cognitive Computing Affect the Development of Artificial Intelligence" *Hindawi Complexity*10 (2020)*available at:* https://doi.org/10.1155/2020/1680845(last visited on December 31, 2022).

[4] Lakshmi Shankar Iyer, "AI enabled applications towards intelligent transportation" *Transportation Engineering* 2 (September 2021) *available at*https://doi.org/10.1016/j.treng.2021.100083 (last visited on December 30 2022).

[5] Takeyoshi Imai, "Concepts of Automobiles, Autonomous Driving, and Drivers" 5 *Kenshu* 822 (2016).

[6] SAE International's On-Road Automated Vehicle Standards Committee published the SAE Information Report Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles report 2014-

National Highway Traffic Safety Administration (NHTSA) suggests a five-part continuum for understanding this technology, with different benefits gained at increasing levels of automation:

1. No automation (Level 0): All components of the driving task are under the sole control of the human driver.
2. Driver Assistance (Level 1): When a driving assistance system executes steering or acceleration/deceleration activities in a certain driving mode, the driver must maintain continual attention.
3. Partial Automation (Level 2): The execution of both steering and acceleration/deceleration is executed by one or more driving assistance systems in a specific driving mode, with the human driver performing the remaining components of the dynamic driving task.
4. Conditional Automation (Level 3): When an automated driving system performs all parts of a dynamic driving task in a specified driving mode, the human driver is expected to respond correctly to a request to intervene.
5. High Automation (Level 4): An automated driving system's performance of all parts of the dynamic driving task in a given driving mode, even if a human driver does not respond adequately to a request to intervene.
6. Full Automation (Level 5): An automated driving system's continuous performance of all aspects of the dynamic driving task under all road and environmental situations.

In the present scenario, the vehicles are only semi-autonomous, which means that the human control over it is intact. Therefore, the human making the decisions at the time of driving is accountable for the error or inaccuracy of the vehicle. Under the present legal framework, driver is responsible for vehicle's wrongdoings because autonomous vehicles lack legal personhood.[7] In each scenario, the machine performs and makes judgments in manners that can be linked back to the machine's design, programming, and knowledge encoded by humans.[8] There is no need to reassess liability standards where human involvement in machine's decision-making is so obvious. As of now, any human (or corporate entity with the power to do things that humans do, such as enter into contracts, hire workers, and so on) who participates in the machine's development and helps map out its decision-making is potentially liable for wrongful acts committed by or involving the machine, whether negligent or intentional.[9]

In contrast, one of the primary goals of autonomous vehicles is to reduce the amount of driver oversight required, both to maximize safety and to exploit the potential for increased productivity during long travels. As a result, in the case of completely autonomous vehicles, states should grant these vehicles some official legal status, making them legally responsible for their acts and decisions.[10] The concept of full autonomy is reduced by artificial intelligence theorists to the paradigm of computers that "sense-think-act" without human input or

10-02 https://www.sae.org/news/press-room/2014/10/sae-international-technical-standard-provides-terminology-for-motor-vehicle-automated-driving-systems

[7]Vladeck, David C. Machines Without Principals: Liability Rules And Artificial Intelligence. Washington Law Review 2014, 89 (1), pp 117-150, p 121

[8]O'Brien v. Intuitive Surgical, Inc., No. 10 C 3005, 2011 WL 304079

[9]Ibid.

[10]Ibid 124.

assistance.[11] Laws governing autonomous vehicles should grant these vehicles some kind of legal personality, recognizing that they are capable of causing harm and being completely liable for it, avoiding the difficulty of determining who is responsible.

To ensure safety and security of users and by-standers on roads, autonomous vehicles must travel through complicated and rapidly changing situations, such as traffic, weather, and detours, and must make key judgments, such as which route to follow, which lane to be in, which exit to take, and so on.[12]

Legal Issues Arising Due to Introduction of Autonomous Vehicles

Conventional cars and road traffic are governed by international and national laws. The modern world is always evolving; however, laws are sluggish to respond to these changes. Furthermore, all advancements require competent legislation, but the construction of robust and intelligible laws takes time.[13] The adoption of autonomous vehicles poses a challenge because existing laws do not regulate these vehicles, and prior to their use on public roads, coherent and adequate legislation is required. Legislators all across the world are trying to figure out how autonomous vehicles will affect existing laws, as well as comprehending and resolving the legal, regulatory, and ethical challenges surrounding them.[14]Laws and regulations are essential to the growth of autonomous vehicles, despite the fact that legal concerns surrounding autonomous vehicles are complex and difficult, and hence may impede progress.[15]Although autonomous vehicles have several advantages and benefits, legal elements remain unknown, posing significant obstacles for legislators and manufacturers, as issues of legality, liability, responsibility, and insurance, as well as privacy and cyber security, must be addressed and explained.[16] It is currently unclear how courts should handle issues with autonomous vehicles in the absence of adequate legislation.[17]

The two major regulations that govern motor vehicles in India are the Motor Vehicles Act of 1988 and the Consumer Protection Act of 1986. The Motor Vehicles Act of 1988 regulates the minimum age for driving an automobile, as well as the liability and registration of the vehicle. The Consumer Protection Act of 1986, on the other hand, governs damages resulting from carelessness, industrial errors, construction problems, and unfair business practices.[18]There is currently no special regulation in India to control self-driving automobiles. The 2019 amendment to the Motor Vehicle Act has no effect on self-driving or autonomous vehicles. With AI, there is always the question of personhood and agency to consider. The Consumer Protection Act of 2019 defines product liability as "the responsibility of a product manufacturer or product seller, of any product or service, to compensate for any harm caused to a consumer by such defective product manufactured or sold, or by deficiency in

[11]Ugo Pagallo, THE LAW OF ROBOTS: CRIMES, CONTRACTS AND TORTS 2 (2013).
[12] Dylan LeValley, Note, Autonomous Vehicle Liability—Application of Common Carrier Liability, 36 SEATTLE U. L. REV. 5, 7 (2013).
[13] Holder, C. *et al*. Robotics and law: Key legal and regulatory implications of the robotics age (Part I of II). Computer Law & Security Review 2016, 32 (3), pp 383-402, p 386.
[14] Tettamanti, T. *et al*. Impacts of Autonomous Cars from a Traffic Engineering Perspective. PeriodicaPolytechnica: Transportation Engineering 2016, 44(4), pp 244-250, p 249
[15] Tettamanti, T. *et al*. Impacts of Autonomous Cars from a Traffic Engineering Perspective. Periodica Polytechnica: Transportation Engineering 2016, 44(4), pp 244-250, p 250
[16] Bogue, R. Robot ethics and law. Industrial Robot: An International Journal 2014, Vol. 41 (5) pp 398-402, p 400.
[17] Beiker, Sven A. Legal Aspects of Autonomous Driving. Santa Clara Law Review 2012, 52(4), pp 1145-1156, p 1152.
[18] https://lawreview.nmims.edu/self-driving-cars-and-india-a-call-for-inclusivity-under-the-indian-legal-position/#:~:text=Currently%20in%20India%20there%20is,AI%20%E2%80%93%20of%20personhood%20and%20agency.

services relating thereto," as defined under section 2(34). So, if we regard AI to be a product, the maker has full responsibility for whatever harm it causes.

In India, there has been relatively minimal discussion on AI's accountability. Notably, in 2018, the NITI Aayog released a policy paper titled National Strategy for Artificial Intelligence, which explores how AI may be used in areas such as healthcare, agriculture, and automobiles, but it does not address the question of AI liability. The main debate now is whether India should follow the British model, in which the owner is liable even if the AI makes a mistake, or the German model, in which the car maker is liable when the AI makes a mistake. In a developed society, the law should be dynamic rather than stagnant. It should change in response to societal demands. At this point, it's vital to recognize that autonomous vehicles have brought with them a slew of major issues that will require a thorough legislative framework to address. The issues that arise as a result of the adoption of autonomous vehicles, such as responsibility assessment, insurance, privacy, and so on, must be adequately addressed under an updated legal structure. The existing condition of lawlessness poses a significant danger to the motor industry's technological growth. The lives of individuals, national resources, and private businesses attempting to create advanced autonomous vehicles are all at risk, necessitating immediate legislative action.

Issues Regarding Driving License and Traffic Rules in Relation to Automated Vehicles

At the moment, driverless vehicles raise a lot of worries about driver's licences. All drivers must currently have a valid driver's licence in order to operate and manage the vehicle. As a result, it must be determined what type of licence, if any, is required to operate an autonomous vehicle, whether a licence is required for fully autonomous vehicles in which the human does not control the vehicle, and what prerequisites and training are required to obtain an autonomous vehicle licence.[19]

The Motor Vehicles Act of 1988 governs road travel in India. The Act comprises 217 provisions that cover a wide range of driving licence, car registration, and other laws and regulations in India. Regional Transport Offices in India execute these legislative provisions for driving licence and registration. Section 3 of the said Act states that operating a vehicle without a valid driver's licence is a crime punishable under the law. Section 4 of the MV Act specifies the minimum age for applying for a driver's licence which is 16 years for two-wheelers under 50 cc, 18 years for other cars and 20years for transport vehicles. The Centre intends to empower the licencing body to grant licences to differently abled people under the Motor Vehicles (Amendment) Bill, 2019.[20]

It's tough to say what kind of automation self-driving cars would provide for now. The most likely scenario is that these vehicles will feature a manual override function, allowing the driver to take control of the self-driving portion if necessary. For the sake of everyone's safety, the person behind the wheel must go through a process and obtain a driver's licence. As a result, it is unlikely that the driver's licence will be phased out very soon. The driver's licence number will still be important, and a person will be subject to traffic fines if they do not have one. The driving licence might become obsolete only when cars become totally autonomous and no manual involvement is required to drive them.[21]

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[19] Holder, C. *et al*. Robotics and law: Key legal and regulatory implications of the robotics age (Part I of II). Computer Law & Security Review 2016, 32 (3), pp 383-402, p 388.

[20] https://www.moneycontrol.com/news/india/motor-vehicles-bill-2019-govt-aims-to-ease-driving-licence-process-for-differently-abled-4230731.html

[21] https://ackodrive.com/driving-license/what-will-happen-to-your-driving-license-when-self-driving-cars-takeover/

Furthermore, driverless vehicles wreak havoc on current traffic laws and regulations. Autonomous vehicles can operate in autopilot mode, hence each state should decide whether their laws will regulate passenger or autopilot modes, and then define the term "operate" because current laws assume that the operator controls the vehicle, whereas in the case of autonomous vehicles, the operator could simply be a passenger with no control over the vehicle.[22] Furthermore, some existing driving restrictions must be reconsidered, such as the prohibition of using a cell phone while driving, which would be useless in the event of autonomous vehicles.[23]

The Motor Vehicles Act of 1988, in its current form, makes no provision for autonomous vehicles in any capacity, including testing on Indian roads. The aforementioned Act lays out in detail the legislative provisions governing driver/conductor licensing, vehicle registration, vehicle control through permits, special provisions relating to state transportation undertakings, traffic regulation, insurance, liability, offences and penalties, and so on. An amendment to the Motor Vehicles Act allowing for autonomous vehicle testing has been in the works for more than four years, but has gotten little momentum.[24]In reality, the best-case situation would be for India to create a distinct autonomous vehicle regulation. Furthermore, according to section 109 of the Motor Vehicles Act, every motor vehicle must be manufactured and maintained in such a way that it is always under the effective control of the person operating it, which is not the situation with autonomous vehicles.

Analysis of Indian Automobile Insurance System with Reference to Autonomous Vehicles

The current liability system is premised on the idea that there are two major types of risk associated with the operation of motor vehicles: first, the failure of the hardware, i.e. the product, which triggers product liability, and second, the action of (and/or damage to) a driver, which triggers liability as covered by the national insurance regime. The introduction of semi-autonomous and autonomous vehicles would add to the existing list of risks that are often overlooked by India's current insurance system. With the introduction of autonomous vehicles, issues such as software failure, network failure, hacking, and cybercrime are likely to emerge, and India's current insurance system is insufficient to deal with these risks.[25] For the insurance industry, knowing who is liable for accidents is critical because it determines who should bear the costs when an accident occurs.[26] Legislators must design and adopt legislation that establishes a framework for insurance issues, and the insurance industry must develop rules for dealing with liability and insurance issues related to autonomous vehicles.[27]

In India, as well as the rest of the world, having your car insured is a legal requirement, not a choice. Before a car can drive on the road, it must be covered by an appropriate insurance policy. According to the Motor Vehicle Act of 1988, all motor vehicles in India must have proper

[22] Douma, F., Palodichuk, Sarah A. Criminal Liability Issues Created by Autonomous Vehicles. Santa Clara Law Review 2012, 52(4), pp 1157-1170, p 1162.
[23] Holder, C. *et al*. Robotics and law: Key legal and regulatory implications of the robotics age (Part I of II). Computer Law & Security Review 2016, 32 (3), pp 383-402, p 387.
[24] https://www.lexplosion.in/autonomous-vehicles-and-the-challenges-in-india/#:~:text=As%20the%20Act%20provides%20that,licence%20for%20autonomous%20vehicle%20users.
[25] Holder, C. *et al*. Robotics and law: Key legal and regulatory implications of the robotics age (Part I of II). Computer Law & Security Review 2016, 32 (3), pp 383-402, p 387
[26] Vladeck, David C. Machines Without Principals: Liability Rules And Artificial Intelligence. Washington Law Review 2014, 89 (1), pp 117-150, p 129.
[27] Bogue, R. Robot ethics and law. Industrial Robot: An International Journal 2014, Vol. 41 (5) pp 398-402, p 400.

third-party insurance coverage at all times, according to the Motor Vehicles Act of 1988.[28] A vehicle must have third-party legal liability insurance at the very least before it can be driven on a public road. A third-party legal liability policy will cover the expense of any legal obligations that may emerge if your car is involved in an accident in which a third person is harmed or property is damaged by a third party. Violations of the Motor Vehicles Act can result in serious consequences or penalties. [29] If one is not diligent and their insurance policy expires, they may be fined for operating a vehicle without insurance. For a first-time offence of this sort, the traffic authorities levy a fine of Rs.2000. However, repeat offences can lead to penalties of up to Rs.4000.

The current system in Sweden, in which victims are compensated by insurance and then the insurance, decides whether or not to pursue a product liability claim against manufacturers, may provide a solution to the insurance problem; however, this system is extremely reliant on state funding and thus may face challenges in other jurisdictions.[30] In Sweden and Norway, there is a system of no-fault insurance that is based on solidarity rather than blame, risk, or other types of personal (human) liability. Victims injured by the operation of a motor vehicle can claim compensation from the keeper's liability-motor-insurance under the Swedish Traffic Damage Act (Trafikskadelagen, 1975/1410). The right to collect is based solely on the insurer's objective liability; it is not based on the driver's, owner's, possessor's, or keeper's personal responsibility. The owner, possessor, or driver of the vehicle has shifted obligation to his liability insurer. The regulations on fault-based culpability can still be used in Sweden, at the victim's discretion. This is comparable to the French and Belgian system of 'automatic compensation', that provides for insurances cover to the victim regardless of the liability.

United Kingdom is a country in Europe. Currently, the United Kingdom is a forerunner in introducing legislation to establish a particular compensation mechanism for harm caused by autonomous vehicle accidents. According to the Automated and Electric Vehicle Act of 2018 (AEVA), if "an insured person or any other person suffers damage as a result of the accident," the liability motor insurance is liable for the damage caused by an accident "caused by an automated vehicle while driving itself."[31] The liability insurance only covers death, personal injury, and restricted property damage: property damage excludes damage to the automated motor vehicle, as well as property in the insured person's custody or control, among other things.[32] In case of the victim's own contribution to the accident will limit his entitlement to obtain compensation.[33] The act allows liability insurers to exclude or limit their liability against an insured person in their policies (thus contractually) if the latter fails to install software updates or makes alterations to the vehicle's operating system that are prohibited by the policy.[34] The liability insurer may sue "any other person liable to the injured party in respect of the accident." This entitles the liability insurer to seek restitution from the manufacturer, in cases of defect, or from other traffic members who were at fault. The legislators in India need

[28]https://www.godigit.com/traffic-rules/traffic-rules-every-motor-vehicle-drive-in-india-should-know
[29]https://www.bankbazaar.com/insurance/motor-insurance-guide/why-is-car-insurance-compulsory-in-india.html
[30] Holder, C. *et al*. Robotics and law: Key legal and regulatory implications of the robotics age (Part I of II). Computer Law & Security Review 2016, 32 (3), pp 383-402, p 387
[31] Section 2, The Automated and Electric Vehicle **Act 2018** (AEVA) 2018
[32] Section 2, The Automated and Electric Vehicle **Act 2018** (AEVA)
[33] Section 3 The Automated and Electric Vehicle **Act 2018** (AEVA)
[34] Section 5 The Automated and Electric Vehicle **Act 2018** (AEVA)

to consider the model followed by these countries to reform the insurance laws so that it would be deemed fir to incorporate autonomous vehicle.

Data Protection and Privacy Issues Concerning Safe Operation of Autonomous Vehicles

One of the major issues that are likely to emerge due to introduction of autonomous vehicles is "Privacy". Autonomous vehicles are required to share information and communicate with other vehicles, resulting in the creation and processing of data. As a result, it is critical that all vehicles comply with privacy regulations in order to protect any sensitive data.[35] Collecting data from autonomous vehicles is very crucial for further research and development because the vehicles use this data to tackle similar future incidents. The data from the autonomous vehicle could also be used in the case of an accident to provide the location of the vehicle, information about the speed and passengers aiding in liability distribution.[36] However, data and information about the vehicle, driving, and location information require appropriate safeguards; otherwise, this data could be used by governments to track individuals, law enforcement to spy on them, or hackers to control the vehicles and even cause accidents.[37] The collected data could be useful if it is adequately and appropriately safeguarded. To protect the personal data generated and collected by autonomous vehicles, the software and technology could include encryption measures.[38] However, there must be a provision in the laws that oblige the data holder to disclose the information for investigation, inquiry or detection of illegal activity. This issue was also raised in a case that was initiated as a result of GPS surveillance for a criminal investigation. The applicant claimed that the surveillance and use of data violated Article 8 of the European Convention on Human Rights by infringing on the right to respect for private and family life. The European Court of Human Rights held in the case Uzun v. Germany[39] that surveillance via GPS and the use of data obtained from the GPS does not comprise a violation of the right to respect for private life.

Currently, India currently lacks clear and unambiguous legislation governing data protection or privacy. However, the relevant data protection laws in India are the Information Technology Act, 2000 and the (Indian) Contract Act, 1872. A codified data protection law is likely to be introduced in India in the near future.[40] The fundamental right to privacy is not expressly granted in the Indian Constitution. However, the courts have incorporated the right to privacy into other existing fundamental rights, such as freedom of speech and expression under Art 19(1)(a) and the right to life and personal liberty under Art 21 of the Indian Constitution. However, these Fundamental Rights under the Indian Constitution are subject to reasonable restrictions imposed by the State under Article 19(2) of the Constitution. Recently, in the landmark case of Justice K S Puttaswamy (Retd.) & Anr. vs. Union of India and Ors., the Hon'ble Supreme Court's constitution bench declared the right to privacy to be a fundamental right, subject to certain reasonable restrictions.[41]

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[35] Tettamanti, T. *et al*. Impacts of Autonomous Cars from a Traffic Engineering Perspective. PeriodicaPolytechnica: Transportation Engineering 2016, 44(4), pp 244-250, p 244.

[36] Holder, C. *et al*. Robotics and law: Key legal and regulatory implications of the robotics age (Part I of II). Computer Law & Security Review 2016, 32 (3), pp 383-402, p 391

[37] Fagnant, D., Kockelman, K. Preparing a nation for autonomous vehicles: opportunities, barriers and policy recommendations. Transportation Research Part A: Policy & Practice 2015, 77, pp 167-181, p 178.

[38] Pagallo, U., Durante, M. The Pros and Cons of Legal Automation and Its Goverance. European Journal of Risk Regulation 2016, 7 (2), pp 323-334, p 325.

[39] ECHR 2.9.2010, 35623/05, Uzun vs. Germany.

[40] https://www.mondaq.com/india/data-protection/655034/data-protection-laws-in-india--everything-you-must-know

[41] https://www.mondaq.com/india/data-protection/655034/data-protection-laws-in-india--everything-you-must-know

The (Indian) Information Technology Act, 2000 addresses issues such as payment of compensation (Civil) and punishment (Criminal) for wrongful disclosure and misuse of personal data, as well as breach of contractual terms relating to personal data.[42] Section 43A of the (Indian) Information Technology Act, 2000 states that a body corporate that possesses, deals with, or handles any sensitive personal data or information and is negligent in implementing and maintaining reasonable security practises, resulting in wrongful loss or wrongful gain to any person, may be held liable to pay damages to the person so affected. It is important to note that there is no upper limit on the amount of compensation that can be claimed by the affected party in such cases.[43] The Government has notified the *Information Technology (Reasonable Security Practices and Procedures and Sensitive Personal Data or Information) Rules, 2011*. The Rules only deals with protection of "Sensitive personal data or information of a person", which includes such personal information which consists of information relating to:-[44]

- Passwords;
- Financial information such as bank account or credit card or debit card or other payment instrument details;
- Physical, physiological and mental health condition;
- Sexual orientation;
- Medical records and history;
- Biometric information.

The rules provide the reasonable security practices and procedures, which the body corporate or any person who on behalf of body corporate collects, receives, possess, store, deals or handle information is required to follow while dealing with “Personal sensitive data or information”. In case of any breach, the body corporate or any other person acting on behalf of body corporate, the body corporate may be held liable to pay damages to the person so affected.

The public will accept self-driving cars only if it is certain that they are safe, dependable, and protect drivers' privacy.[45] Manufacturers and designers must devise a method to secure systems so that unauthorized individuals cannot access and modify them.[46] Since autonomous vehicles acquire, store, and share data, India needs to formulate a strict data protection regime that clearly lays out the rules and regulations for data protection and privacy.

At this juncture, it is important to consider the Data Protective Directive released by European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data. The European Union´s Data Protection Directive[47] concerning the protection of personal data lays down the principles and requirements of data protection and data processing. As a result, systems that process data collected by autonomous vehicles must adhere to the current Data Protection Directive.

[42]https://www.mondaq.com/india/data-protection/655034/data-protection-laws-in-india--everything-you-must-know
[43]https://www.mondaq.com/india/data-protection/655034/data-protection-laws-in-india--everything-you-must-know
[44]https://www.mondaq.com/india/data-protection/655034/data-protection-laws-in-india--everything-you-must-know
[45] Wood, Stephen P. *et al*. The Potential Regulatory Challenges Of Increasingly Autonomous Motor Vehicles. Santa Clara Law Review 2012, 52 (4), pp 1423-1502, p 1448.
[46] Wood, Stephen P. *et al*. The Potential Regulatory Challenges Of Increasingly Autonomous Motor Vehicles. Santa Clara Law Review 2012, 52 (4), pp 1423-1502, p 1466.
[47] Directive 95/46/EC OF the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data, OJ 1995 No L 281, 23 November 1995.

Furthermore, the processing must adhere to the General Data Protection Regulation's requirements. According to Article 6(1)(b) of the Data Protection Directive, autonomous vehicles must collect data only to the extent required to achieve a specific and legitimate goal.[48] For instance, the data could be collected solely for the purpose of arriving at a specific destination or being used in an accident investigation. Furthermore, Article 6(1)(e) states that data collected must not be kept for any longer than is necessary to achieve the purpose for which the data was collected. Furthermore, the collection and use of personal information should be based on the consent of autonomous vehicle users.[49]

Conclusion

Legal regulation of self-driving vehicles is a fairly complex phenomenon that is the need of the hour. The most significant advantage of self-driving vehicles is a much safer driving environment. However collisions, mishaps and accidents will always be a part of motor vehicle travel, and it must be decided who will be held accountable in such cases. Apart from this, there are various legal issues such as insurance, privacy, data-protection, ethical concerns, liability issues which need to be catered by a strong legal mechanism. As technology advances and becomes more reliable, the number of semi-autonomous and autonomous vehicles on the road is expected to rise significantly over the next decade. These vehicles have the potential to revolutionize personal mobility and also improving road safety. Legislators will need to "set the cursor" somewhere and cull out limitations for the programming and development of autonomous vehicles in order to provide guidance and legal certainty to engineers. In order to anticipate potential issues, general regulatory principles and legal frameworks for AI-driven vehicles should be developed, as well as a specific human rights impact assessment of autonomous vehicle technology.

After an in-depth analysis of the existing issues and comprehensive readings of international standards and statutes providing for the solutions to these challenges, it is unfortunate to mention that India is lagging behind on many fronts. The current legal framework of India is neither efficient nor sufficient to deal with this technological advancement. Legislative adjustments are needed to incorporate the technology as well as the allied challenges.

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[48] Directive 95/46/EC OF the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data, *supra* nota 128.

[49] Glancy, Dorothy J. Privacy in Autonomous Vehicles. Santa Clara Law Review 2012, 52 (4), pp 1171- 1239, p 1200.

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