

Information Technology Law

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FIXING LIABILITY FOR THE FAILURES OF INTELLIGENT MACHINES

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Intelligent machines or “machines with self-acquired intelligence” (the term denotes all types of AI including robots, drones, automated vehicles, bots) are becoming increasingly popular. Unlike the previous generation of machines that were “expert systems” based on a set of rules pre-programmed into them, modern day intelligent machines have the ability to “acquire” more and more intelligence without human intervention. This “self-learning” ability allows these machines to take actions based on such “intelligence”.

Our society will largely benefit from these technological breakthroughs that will enhance efficiency, optimise resource usage, improve process reliability, etc. However, these intelligent machines are not error-free and may cause accidents that damage property and/or persons. How to fix liability for such damages and who is culpable is a question that perhaps does not yet have a clear answer. Can we use the principles of strict liability, or principles of agency and attribute liability to the owner of this machine or to the manufacturer of this machine? Or is the person who programmed liable? In order to prescribe a law on this vital topic, we could consider

applying the concepts of strict liability, autonomy, agency, intention (mens rea), responsibility and culpability. Through this article the author intends to provoke a discussion on this complex and emerging legal issue.

The concept of product liability for the actions and failures of machines presupposes human control on those machines. Hence, for any accidents caused by the machines the liability is determined after determining the cause of the accident. If it is found to have been caused by the negligence or failure of the user/operator, then that individual will be liable. If machine failure is clearly established as the cause of the failure or accident, then the manufacturer of the machine is made liable. If there is a manufacturing defect, or a design defect or even a failure on the part of the manufacturer to warn user about the non-obvious risk factors, the manufacturer is invariably made liable for accidents resulting therefrom. In addition to the above, there is a great degree of consensus evolving on imposing strict liability on manufacturer.

To summarise the concept of strict liability, let me quote Justice Roger J. Traynor:

Even if there is no negligence, however, public policy demands that responsibility be fixed wherever it will most effectively reduce the hazards to life and health inherent in defective products that reach the market. It is evident that the manufacturer can anticipate some hazards and guard against the recurrence of others, as the public cannot. Those who suffer injury from defective products are unprepared to meet its consequences. The cost of an injury and the loss of time or health may be an overwhelming misfortune to the person injured, and a needless one, for the risk of injury can be insured by the manufacturer and distributed among the public as a cost of doing business. It is to the public interest to discourage the marketing of products having defects that are a menace to the public. If such products nevertheless find their way into the market it is to the public interest to place the responsibility for whatever injury they may cause upon the manufacturer, who, even if he is not negligent in the manufacture of the product, is responsible for its reaching the market. However intermittently such injuries may occur and however haphazardly they may strike, the risk of their

*occurrence is a constant risk and a general one. Against such a risk there should be general and constant protection and the manufacturer is best situated to afford such protection.*¹

The concept of manufacturer's strict liability cannot be entirely applied to intelligent machines in the same form as it is applied to other machines. Intelligent machines are the combination of many systems such as hardware (electronic and mechanical), software and data. The foundation of "intelligence" is neural networks (a type of computer architecture onto which artificial intelligence is built) and machine learning (it is a program you might run on a neural network, training computers to look for certain answers); and deep learning based on the data from different sources including internet. Therefore, the manufacture of an intelligent machine is a collective exercise involving many companies. Also, the sources of data for acquiring "intelligence" could be many, including the internet. Modern intelligent machines are to a great extent autonomous and have the ability to function outside the control of human beings. They have the ability to take decisions based on the data that the machines gather. These decisions can go wrong due to inaccurate raw data gathered by the machines or due to inaccurate processing of data. Indeed, errors may also occur due to mechanical defects or incorrect implementation of its decisions due to faulty signalling or electronics. Hence, these machines are imbued with human attributes such as the ability to process data, arrive at conclusions, make decisions based on

those conclusions and implement actions. In many instances, such actions by intelligent machines are not controlled by human beings. This increasing autonomy of intelligent machines challenges the above concepts on liability.

Intelligence imbues machines with the ability to decide and grants "personality" to them. Can we therefore apply the principles of control to fix liability assuming personality to these machines? In case of an error committed by a human employee in an employer-employee relationship, the employer is generally held liable for the actions of the employee by applying the principles of vicarious liability. In the case of an employer-human employee relationship, the employer has a *strict* and *secondary liability* for the acts of its employees. Under the *common law* doctrine of *agency*, the "superior" or, in a broader sense, a third party that has the "right, ability or duty to control" the activities of the doer whose action has resulted in an injury is made liable. Applying a similar analogy, can we consider intelligent machines as agents of the principals? If yes, then a complete redefinition of the concept of agency is required. Can we call these intelligence machines as "legal persons" for us to conclude that they are agents of its masters? If we say yes, then it begs the question: is it the whole machine or is it only the "intelligence" that makes it function that can be called as a "legal person"? Since intelligent machines are created by using many components from different sources, are we to consider the whole machine as a legal person or can we attribute personality to each of its components? Jurisprudence says that a person who is liable should be able to understand the scope and extent

of the risks and consequences of his/her actions and therefore, the associated liability. However, in the case of intelligent machines, the creator is not always in a position to assess this. In such instances, what kind of insurance schemes can we create to mitigate risks? Can we introduce the principles of joint and several liabilities in such cases? The joint and several liability is more burdensome to the contributor who has the deepest pockets. If we increasingly make the manufacturers liable invoking this concept of joint and several liability, will it not impact innovation?

Another, analogy is treating these machines like domesticated animals. Whether the principles of strict liability can be applied to intelligent machines in the same way as they are applied to the wrongdoings of domestic animals. To mitigate risks all machines that are prone to accidents regulators have introduced some standards and specified safe operating limits. What kind of such standards can we introduce in the context of intelligent machines so that a fair predictability of adverse risks is achieved?

In *O'Brien v. Intuitive Surgical, Inc.*² and *Mracek v. Bryn Mawr Hospital*³, US courts considered the liability of error on the error of *Da Vinci* robot that performs surgery. In the said case the US Court concluded that anyone that has a role in the development of the machine and helps to map out its decision making is potentially responsible for wrongful acts involving the machines committed by neglect or intentionally. This attributes the entire liability on the manufacturer. However, can such a conclusion

1 *Escola v. Coca-Cola Bottling Co.*, 24 Cal 2d 453 (1944).

2 Case No. 1:2010cv03005, order dated 25-7-2011.

3 Case No. 09-2042 dated 28-1-2010.

be extended to fully autonomous machines like driverless cars or drone aircraft? Already, there are many machines that have the ability to “sense” and “think” without human intervention. As such, these devices are more like persons than machines. The act of such autonomous machines including the neglect and inaccurate actions cannot always be considered as a manufacturing flaw or a programming flaw; instead, it may be characterised as an unforeseen byproduct of teaching the machine to “think”. If a employee acts within the scope of employment when performing the work assigned by the employer or engaging in a course of conduct subject to the employer’s control, then the employer is liable. On the other hand, if an employee acts outside the scope of his or her employment and an accident occurs, should the employer be liable for this? This is the essence of *Charles LEV v. Beverly Enterprises Massachusetts, Inc.*⁴ case. Can we treat an intelligent machine like a child? A parent is liable for the damage caused by the negligent or intentional acts committed by his/her child. The exceptions are usually children below 8-10 years. In determining tort liability for children in many jurisdictions there are special rules, usually based on the age of the minor. In many jurisdictions, a child below 8 (the age varies State to State) cannot be called negligent. In the case of children between the ages of 8 and 14, there is a rebuttable presumption that the child could not be negligent. Between age 14 and 21, there is a rebuttable presumption that the child is capable of negligence.

There is no such age based demarcation in India except in criminal liability matters.

In *M.P. SRTC v. Abdul Rahman*⁵, Madhya Pradesh High Court opined that, “A child remains a child in spite of all training and directions and if anything sparkles it is the glory of his innocence which makes him indifferent to the risks which an adult apprehends and pays attention.” As such, the Court held that a child cannot be liable for contributory negligence. This is the consistent view of all other Indian courts as well.

In California, there is a special Code limiting the parent’s obligations. California Civil Code S. 1714.1 (2005) says

1714.1(a) Any act of wilful misconduct of a minor that results in injury or death to another person or in any injury to the property of another shall be imputed to the parent or guardian having custody and control of the minor for all purposes of civil damages, and the parent or guardian having custody and control shall be jointly and severally liable with the minor for any damages resulting from the wilful misconduct.

Subject to the provisions of subdivision (c), the joint and several liability of the parent or guardian having custody and control of a minor under this subdivision shall not exceed twenty-five thousand dollars (\$25,000) for each tort of the minor, and in the case of injury to a person, imputed liability shall be further limited to medical, dental and hospital expenses incurred by the injured person, not to exceed twenty-five thousand dollars (\$25,000).

So to fix liability, should intelligent machines be treated as employees or as minor children? If the latter, should they be treated as infants or adolescents? Or should these intelligent machines be legally treated on par with domesticated animals? What kind of liability should then be imposed on the person who is deemed to control these machines, though in many instances, in fact may have very minimal control?

How to make people liable for the failure of “intelligence” of these intelligent machines is clearly a legal challenge. Can the creator of these machines be liable legally or morally? Or should liability be pegged to the owner of the machine or the person who is using it? It is quite clear that the traditional principles of liability are surely inadequate to address this situation. The problem is far more complex because many of these machines are configured for open-ended (continuous) learning and fine tune its own responses based on the increased learning. Hence, the same intelligent machines could be “more intelligent” without human control and on the contrary, may also lead to intelligence failures without human control. What principles of law should therefore applied in these instances?

We should not confine the discussions on liability to tort liability; criminal liability must also be considered. Can human beings be criminally prosecuted for wrong decisions and/or actions of intelligent machines taken without the direct control of human beings who may technically control/own them? An affirmative answer means we are fundamentally deviating from the principles of mens rea. Does that mean that there is no criminal liability for the wrongs of intelligent

4 457 Mass 234 (2010).

5 1997 SCC OnLine MP 58 : (1997) 2 MP LJ 224 : AIR 1997 MP 248.

machines? Taking such a view can only lead to greater chaos, with criminals happily creating machines that will commit crimes on behalf of their masters.

All across the world these issues are getting discussed and new legislative attempts are being made to address liability issues. It is however fair to say that none of these attempts as yet cover all the above concerns. UK Parliament introduced the Vehicle Technology and Aviation Bill, 2016⁶. This Bill states that where an accident is caused by an automated vehicle when driving

itself then the insurer is liable for that damage. On the other hand, if the vehicle is not insured, then the owner of the vehicle is liable for the damage. This Bill further says that an insurance policy in respect of an automated vehicle may exclude or limit the insurer's liability, if the accident happened:

- as a direct result of alterations to the vehicle's operating system that are prohibited under the policy made by the insured person, or with the insured person's knowledge; or
- a failure to install software updates to the vehicle's operating system that the insured

person is required under the policy to install or to have installed.

This law does not address all the above concerns. It is, however, definitely a good beginning to address this issue. In the near future, we can expect many legislative attempts seeking to address the liability on accidents and wrongs of intelligent machines. Perhaps "ROSS" or "Watson" will help in propounding for us the jurisprudence on this issue.

6 <https://www.publications.parliament.uk/pa/bills/cbill/2016-2017/0143/cbill_2016-20170143_en_2.htm>.

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