The Applicability of Product Liability to Artificial Intelligence Systems

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Abstract

In this article I examine the applicability of the *Australian Consumer Law* provisions on product liability for defective goods to artificial intelligence ('AI') systems. I argue that significant reforms are necessary to effectively address defects in AI systems. Key areas for reform include clarifying the term 'component' of goods to encompass digital elements such as AI-related services and revising the classification of manufacturers to reflect the roles of various parties in AI development and deployment. Most critically, the test for assessing defectiveness should be reconstructed to capture the distinctive characteristics of defects in AI systems. Moreover, the scope of actionable damage should be expanded to ensure comprehensive protection for individuals harmed by defective AI systems. Drawing on comparative insights from the European Union and the United States, I suggest that the successes and limitations of these jurisdictions in addressing liability for defective goods provide valuable lessons for Australia to strengthen its product liability regime in the age of AI-driven technologies.

I   Introduction

Artificial intelligence ('AI') systems, characterised by their ability to perform tasks such as learning, reasoning, problem-solving, and decision-making, have rapidly advanced over the past few decades.[1] These systems range from simple algorithms embedded in everyday applications to complex neural networks driving technologies like autonomous vehicles, medical diagnostics, and financial trading.[2] They are

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[1]   Stuart Russell and Peter Norvig, *Artificial Intelligence: A Modern Approach* (Pearson, 4th ed, 2021) 19–22; Margaret A Boden, *Artificial Intelligence: A Very Short Introduction* (Oxford University Press, 2018) 1; Ian Goodfellow, Yoshua Bengio and Aaron Courville, *Deep Learning* (MIT Press, 2016) 9.
[2]   Russell and Norvig (n 1) 45–8.

increasingly integrated into various sectors, including healthcare, finance, transportation, and manufacturing, transforming products, services, practices, and operations.[3] AI systems offer significant benefits by automating complex tasks, enhancing decision-making with data-driven insights, improving efficiency, and enabling innovation across industries.[4] However, the widespread adoption of AI also raises significant legal, ethical, and safety concerns regarding data privacy, algorithm bias, autonomous decision-making, and the societal impact of automation on jobs and human welfare.[5] As these systems become more autonomous and complex, the potential for harm to persons, property, and other legally protected interests increases, necessitating robust regulatory and legal frameworks to ensure they operate safely and fairly.[6] The issue of liability for AI-caused damage is at the forefront of current legal debates, with ongoing uncertainty about who should be held responsible for the damage caused by AI systems.[7]

The increasing prevalence of AI systems also raises important questions about the role of the *Australian Consumer Law* ('*ACL*')[8] in the digital age.[9] The *ACL* provides a comprehensive legal framework aimed at improving consumer wellbeing and ensuring fair trading practices.[10] A key element is the product liability regime, which holds manufacturers liable for harm caused by defective products.[11] Under these provisions, a product is deemed defective if it does not meet the level of safety that the public is generally entitled to expect. A claimant needs only to prove that the product was defective and caused harm. This framework is designed to simplify the legal process for individuals seeking redress and to incentivise manufacturers to ensure high standards of safety. However, the application of these provisions to AI systems poses significant challenges due to their autonomy, complexity, and reliance on continuous updates.

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3   Organisation for Economic Co-operation and Development ('OECD'), *Artificial Intelligence in Society* (OECD Publishing, 2019) 47–71.

4   See, eg, Russell and Norvig (n 1) 49, 1063–73.

5   See, eg, Yoshua Bengio, Geoffrey Hinton, Andrew Yao, Dawn Song, Pieter Abbeel, Trevor Darrell, Yuval Noah Harari, Ya-Qin Zhang, Lan Xue, Shai Shalev-Shwartz, Gillian Hadfield, Jeff Clune, Tegan Maharaj, Frank Hutter, Atılım Güneş Baydin, Sheila McIlraith, Qiqi Gao, Ashwin Acharya, David Krueger, Anca Dragan, Philip Torr, Stuart Russell, Daniel Kahneman, Jan Brauner and Sören Mindermann, 'Managing Extreme AI Risks Amid Rapid Progress' (2024) 384(6698) *Science* 842, 842–5; Margot E Kaminski, 'Regulating the Risks of AI' (2023) 103(5) *Boston University Law Review* 1347, 1355–65; Russell and Norvig (n 1) 49–52, 1032–57; Benjamin Cheatham, Kia Javanmardian and Hamid Samandari, 'Confronting the Risks of Artificial Intelligence' (2019) 2(38) *McKinsey Quarterly* 1, 1–9.

6   Krishna Deo Singh Chauhan, 'From "What" and "Why" to "How": An Imperative Driven Approach to Mechanics of AI Regulation' (2023) 23(2) *Global Jurist* 99, 102–10; Bengio et al (n 5) 843–5.

7   British Columbia Law Institute ('BCLI'), *Report on Artificial Intelligence and Civil Liability* (BCLI Report No 96, April 2024) v; Phillip Morgan, 'Tort Liability and Autonomous Systems Accidents Challenges and Future Developments' in Phillip Morgan (ed), *Tort Liability and Autonomous Systems Accidents: Common and Civil Law Perspectives* (Edward Elgar, 2023) 1, 3; European Commission Expert Group on Liability and New Technologies – New Technologies Formation, *Liability for Artificial Intelligence and Other Emerging Digital Technologies* (Report, 2019) 34.

8   *Competition and Consumer Act 2010* (Cth) sch 2 ('*ACL*').

9   The Australian Government Treasury recently released its report on the application of the *Australian Consumer Law* to AI–enabled goods and services: see Treasury (Cth), *Review of AI and the Australian Consumer Law: Final Report* (October 2025).

10 Council of Australian Governments, *Intergovernmental Agreement for the Australian Consumer Law* (30 August 2019) objectives.

11 *ACL* (n 8) ss 138–49.

In this article I explore the extent to which the *ACL* provisions can be applied to AI systems. I argue that significant reforms are necessary to effectively address defects in digital products. In Part II I explore AI systems and their potential harms, offering definitions, examples, and the need for regulatory frameworks. In Part III I analyse the applicability, limitations, and potential reforms of the *ACL* product liability provisions in addressing AI-related harms. Finally, in Part IV I conclude with a summary of findings and recommendations for future research.

II   AI Systems and Potential Harm

AI is commonly used to refer to computer systems that can perform tasks and exhibit behaviours typically requiring human intelligence.[12] It encompasses a broad range of techniques, including machine learning, natural language processing, knowledge representation, computer vision, speech recognition, robotics, and introspection.[13] AI aims to mimic human cognitive abilities,[14] including learning, reasoning, problem-solving, perception, and language understanding, allowing systems to interact with their environment, adapt to new situations, and perform complex tasks.[15] When deployed on machines, or hardware, AI is often described as an 'AI system' because it operates as a complete, integrated set of algorithms, processes, and computational structures designed to perform intelligent tasks. The Organisation for Economic Co-operation and Development ('OECD') describes an AI system as

> a machine-based system that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments. Different AI systems vary in their levels of autonomy and adaptiveness after deployment.[16]

The European Union's *Artificial Intelligence Act* ('*EU AI Act*') also defines AI systems in a similar way.[17] Thus, both the OECD and European Parliament definitions capture the key characteristics of AI systems, particularly their capacity to 'infer'. This is a critical and well-documented characteristic that refers to their ability to generate outputs (for example, predictions, content, recommendations, decisions, models or algorithms) from input data.[18] Machine learning techniques are a primary enabler of this inference capability. These techniques allow the system to

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[12]   Russell and Norvig (n 1) 19–22; Boden (n 1) 1; Goodfellow, Bengio and Courville (n 1) 9.
[13]   Russell and Norvig (n 1) 20.
[14]   Robert H Chen and Chelsea Chen, *Artificial Intelligence* (CRC Press, 1st ed, 2022) xi.
[15]   Ewa Harasimiuk and Tomasz Braun, *Regulating Artificial Intelligence: Binary Ethics and the Law* (Taylor & Francis, 2021) 6.
[16]   OECD, *Explanatory Memorandum on the Updated OECD Definition of an AI System* (OECD Artificial Intelligence Paper No 8, March 2024) 6 <https://doi.org/10.1787/623da898-en> ('*Explanatory Memorandum*').
[17]   *Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 Laying Down Harmonised Rules on Artificial Intelligence and Amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act)* [2024] OJ L 12.7.2024, art 3(1) ('*EU AI Act*').
[18]   Andreas Lindholm, Niklas Wahlström, Fredrik Lindsten and Thomas B Schön, *Machine Learning: A First Course for Engineers and Scientists* (Cambridge University Press, 2022) 242, 260.

learn from data and infer patterns to achieve specific objectives.[19] Other methods, like logic-based and knowledge-based systems, enable inference from structured knowledge or symbolic representations.[20] The inference capacity transcends data processing, allowing engagement in learning, reasoning, and modelling. [21] Moreover, both definitions accurately assert that AI systems differ in the extent of their autonomy and ability to adapt once deployed. AI systems are designed with differing capacities for post-deployment adaptation based on their underlying architectures. [22] Machine learning systems using techniques like reinforcement learning can adapt to new data and environments, displaying high autonomy.[23] In contrast, rule-based or symbolic AI systems have limited adaptability, as they follow predefined logic and often require manual updates to evolve. [24] Finally, by distinguishing between explicit and implicit objectives, these definitions emphasise that AI systems may 'develop implicit sub-objectives' that differ from their intended purposes.[25]

It is expected that technological improvements, such as more cost-effective chips, low-cost 3D sensors, the widespread implementation of 5G technology, cloud-based machine learning, advancements in speech recognition, more efficient AI training algorithms, advancements of generative AI, and the use of AI assistants for automating programming, data collection, and chip design, will accelerate the use of AI systems over the next few years.[26] Given their ability to perform complex tasks in real-time, AI systems are often more accurate, efficient, and faster than humans. [27] AI-driven advancements in manufacturing can enhance consumer safety,[28] and autonomous vehicle deployment is expected to make traffic safer.[29]

However, AI systems may also fail and cause damage to persons, property, and other legally protected interests. [30] AI systems, particularly those employing machine learning and neural networks, can make decisions that are difficult for humans to predict or control. Therefore, they may lead to harm, such as health risks

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[19]   Russell and Norvig (n 1) 669–798; Lindholm et al (n 18) 1–285; OECD, *Explanatory Memorandum* (n 16) 8.

[20]   Russell and Norvig (n 1) 264; OECD, *Explanatory Memorandum* (n 16) 8.

[21]   *EU AI Act* (n 17) recital 12.

[22]   See, eg, Abhishek Sivaram and Venkat Venkatasubramanian, 'XAI-MEG: Combining Symbolic AI and Machine Learning to Generate First-Principles Models and Causal Explanations' (2022) 68(6) *AIChE Journal* e17687:1–11.

[23]   Jugal Kalita, *Machine Learning: Theory and Practice* (CRC Press, 2022) 193–230.

[24]   Eleni Ilkou and Maria Koutraki, 'Symbolic vs Sub-Symbolic AI Methods: Friends or Enemies?' (Workshop Paper, Workshop on Combining Symbolic and Sub-Symbolic Methods and Their Applications, 19–20 October 2020) <https://ceur-ws.org/Vol-2699/>.

[25]   OECD, *Explanatory Memorandum* (n 16) 6.

[26]   Bengio et al (n 5) 843; Office for Product Safety and Standards (UK), *Study on the Impact of Artificial Intelligence on Product Safety* (Final Report, December 2021) 25–6.

[27]   Jan De Bruyne and Orian Dheu, 'Liability for Damage Caused by Artificial Intelligence – Some Food for Thought and Current Proposals' in Phillip Morgan (ed), *Tort Liability and Autonomous Systems Accidents: Common and Civil Law Perspectives* (Edward Elgar, 2023) 27, 28.

[28]   See, eg, Office for Product Safety and Standards (n 26) 31–3.

[29]   De Bruyne and Dheu (n 27) 28.

[30]   Ibid. For a list of AI incidents, see 'AI Incident Database' (Web Page) <https://incidentdatabase.ai/>. As of 31 January 2026, there have been 1349 reported AI incidents.

from diagnostic and treatment errors,[31] accidents involving autonomous vehicles,[32] or financial losses from algorithmic trading errors.[33] Recent incidents involving self-driving cars and other autonomous AI-powered systems highlight the risks of such technologies. For example, the autopilot sensors of a Tesla car failed to differentiate a white tractor-trailer from the bright sky, resulting in a fatal crash.[34] Similarly, an Uber self-driving car struck a pedestrian in Arizona, who subsequently died.[35] In another case, a surgical robot malfunctioned during a prostate surgery causing severe injury to the patient.[36] At a tech fair in China, a robot attacked and injured a man.[37] A woman had to call for emergency help after her robot vacuum entangled her hair while she was sleeping on the floor.[38]

III The Application of Provisions on Product Liability to AI Systems: Possibilities, Constraints and the Ways Forward

Technological advancements have driven the development of product liability law. A century ago, there was no established product liability law mandating manufacturers to be responsible for the safety of their products.[39] With the advent of mass-produced consumer goods during the Industrial Revolution, legal systems began holding manufacturers legally liable to consumers for the safety of their products.[40] In Australia, the liability of manufacturers for defective goods was first introduced into the *Trade Practices Act* in 1992 under pt VA and is now superseded by pt 3-5 of the *ACL*. The *ACL* product liability regime, which is largely based on the European Union ('EU') *Product Liability Directive*,[41] holds manufacturers liable for harm caused by defective goods. The product liability regime is partly grounded in economic theory, aiming to enhance economic efficiency by shifting the cost of harm from individual consumers to manufacturers, who can spread this cost across

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31 W Nicholson Price II, 'Medical AI and Contextual Bias' (2019) 33(1) *Harvard Journal of Law & Technology* 65, 90–7; Helen Smith and Kit Fotheringham, 'Artificial Intelligence in Clinical Decision-Making: Rethinking Liability' (2020) 20(2) *Medical Law International* 131, 131–54.

32 Tom Mackie, 'Proving Liability for Highly and Fully Automated Vehicle Accidents in Australia' (2018) 34(6) *Computer Law & Security Review* 1314, 1315.

33 Tom CW Lin, 'Artificial Intelligence, Finance, and the Law' (2019) 88(2) *Fordham Law Review* 531, 541–3.

34 Danny Yadron and Dan Tynan, 'Tesla Driver Dies in First Fatal Crash While Using Autopilot Mode', *The Guardian* (online, 1 July 2016) <https://www.theguardian.com/technology/2016/jun/30/tesla-autopilot-death-self-driving-car-elon-musk>.

35 Sam Levin and Julia Carrie Wong, 'Self-Driving Uber Kills Arizona Woman in First Fatal Crash Involving Pedestrian', *The Guardian* (online, 20 March 2018) <https://www.theguardian.com/technology/2018/mar/19/uber-self-driving-car-kills-woman-arizona-tempe>.

36 *Mracek v Bryn Mawr Hospital*, 363 Fed Appx 925 (3rd Cir, 2010).

37 'Robots v Humans: AI Machine "Attacks" Visitor at Chinese Tech Fair', *RT News* (online, 18 November 2016) <https://www.rt.com/viral/367426-robot-attack-china-technology/>.

38 Justin McCurry, 'South Korean Woman's Hair "Eaten" by Robot Vacuum Cleaner as She Slept', *The Guardian* (online, 9 February 2015) <https://www.theguardian.com/world/2015/feb/09/south-korean-womans-hair-eaten-by-robot-vacuum-cleaner-as-she-slept>.

39 Paul Latimer, *Australian Business Law* (Oxford University Press, 35th ed, 2016) 520.

40 Ibid; Miriam C Buiten, 'Product Liability for Defective AI' (2024) 57(2) *European Journal of Law and Economics* 239, 250.

41 Jeannie Marie Paterson, *Corones' Australian Consumer Law* (Thomson Reuters, 5th ed, 2023) 454–5 [12.20]; David Harland, 'The Influence of European Law on Product Liability in Australia' (1995) 17(2) *Sydney Law Review* 336, 336–46.

all users through product pricing.[42] Manufacturers, rather than consumers, are better positioned to manage and prevent risks due to their control and superior knowledge.[43] The product liability regime does not replace or modify the tort of negligence, but rather offers another avenue for plaintiffs within Australia's comprehensive product liability legal framework.[44]

Under pt 3-5, a manufacturer will be liable to compensate an individual if the following conditions are met:

- the manufacturer supplies the goods in trade or commerce;
- the goods have a safety defect;
- the individual suffers injuries because of the defect;[45] and
- no defences are available to the manufacturer.[46]

The injured party need not be the purchaser for liability to arise.[47] Moreover, dependents may recover losses resulting from injury or death caused by a safety defect.[48] Liability also covers damage to other goods typically acquired for personal, domestic, or household use.[49]

The principle that liability should fall on the cheapest loss avoider or most efficient insurer remains relevant for preventing harm caused by AI systems, as it enhances economic efficiency by minimising the total societal costs. AI developers possess superior knowledge and control, including programming and ongoing updates.[50] This enables them to identify, anticipate, and mitigate risks more effectively than consumers. Placing liability on developers incentivises higher safety standards, robust testing, and continuous monitoring, reducing AI-related incidents. Whether the *ACL*'s product liability regime applies to defective AI systems depends on various factors:

- whether AI systems can be classified as 'goods';
- whether involved parties qualify as 'manufacturers';
- whether AI systems can be deemed to have 'safety defects';
- whether the so-called 'state-of-the-art' defence applies to AI safety defects; and
- what types of harm are compensable.

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42   Paterson (n 41) 455 [12.20].
43   Richard Braddock, *Product Liability: Economic Impacts* (Australian Law Reform Commission, Product Liability Research Paper No 2, 1989) 10.
44   Jocelyn Kellam, S Stuart Clark and Mikhail Glavac, 'Theories of Product Liability and the *Australian Consumer Law*' (2013) 21(1) *Competition and Consumer Law Journal* 1, 3, 67.
45   *ACL* (n 8) s 138(1).
46   Ibid s 142.
47   Roger Gamble and Benjamin Hayward, *Concise Australian Commercial Law* (Lawbook, 8th ed, 2024) 369; *Glendale Chemical Products Pty Ltd v Australian Competition and Consumer Commission* (1998) 90 FCR 40, 44 ('*Glendale Chemical*').
48   *ACL* (n 8) s 139.
49   Ibid s 140.
50   Gerhard Wagner, 'Liability Rules for the Digital Age: Aiming for the Brussels Effect' (2022) 13(3) *Journal of European Tort Law* 191, 193 ('Liability Rules').

A   Can AI Systems Be Classified as 'Goods'?

The *ACL* product liability regime applies only to supplying 'goods', not providing services.[51] Thus, the classification of AI systems as goods or services is critical, as it determines whether the product liability regime is applicable to AI systems. Chagal-Feferkorn argues that certain 'thinking algorithms', which operate without pre-programmed options, select information independently, or require real-time decision-making, are incompatible with the traditional product liability framework.[52] Nevertheless, Chagal-Feferkorn does not propose an alternative classification.[53] Prifti takes a clearer stance, considering AI systems as services rather than products, due to their reliance on complex, skill-dependent processes that result in variable outcomes, akin to the provision of services.[54] Some scholars take a more hybrid approach, viewing AI as both a product and a service depending on its deployment and usage.[55]

Despite this debate, the situation in Australia appears relatively settled. Since the adoption of the *ACL* in 2010, software has been defined as 'goods'.[56] The Australian case law has also confirmed that, as far as consumer law is concerned, software is regarded as goods regardless of its form.[57] The remaining question in Australia is whether AI systems fall within the scope of 'software'. While the *ACL* does not define 'software', scholars have argued that AI systems can be described as a specific form of software that learns, adapts, and evolves based on data-driven mathematical models.[58] The key distinction between traditional software and AI systems lies in how they are constructed: traditional software relies on static, pre-programmed instructions, whereas AI systems are built using data-driven algorithms and learning models.[59] Thus, both can be viewed as variations of software composed of algorithms and code. The *EU AI Act* followed the same approach when it defined 'AI systems' as 'software' in its original version drafted by the European Commission.[60] Although less explicit in its current version,[61] the Act continues to treat AI systems as a complex form of software.[62] Similarly, the *EU Product*

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51   *ACL* (n 8) s 138(1)(a).
52   Karni A Chagal-Feferkorn, 'Am I an Algorithm or a Product? When Products Liability Should Apply to Algorithmic Decision-Makers' (2019) 30(1) *Stanford Law & Policy Review* 61, 107–13.
53   Ibid.
54   Kostina Prifti, 'Is Artificial Intelligence a Product or a Service?' *Robotics & AI Society* (Blog Post, 7 May 2023) <https://blog.ai-laws.org/is-artificial-intelligence-a-product-or-a-service/>.
55   Sebastian Lins, Konstantin D Pandl, Heiner Teigeler, Scott Thiebes, Calvin Bayer and Ali Sunyaev, 'Artificial Intelligence as a Service' (2021) 63(4) *Business & Information Systems Engineering* 441, 442.
56   *ACL* (n 8) s 2(1).
57   *Goldiwood Pty Ltd v ADL (Aust) Pty Ltd* [2014] QCAT 238, [37]. See also Benjamin Hayward, 'What's in a Name? Software, Digital Products, and the Sale of Goods' (2016) 38(4) *Sydney Law Review* 441, 448–50.
58   Lindholm et al (n 18) 1. See also Philipp Hacker, 'The European AI Liability Directives – Critique of a Half-Hearted Approach and Lessons for the Future' (2023) 51 *Computer Law & Security Review* 105871:1–42, 1.
59   Lindholm et al (n 18) 1.
60   *Proposal for a Regulation of the European Parliament and of the Council Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act) and Amending Certain Union Legislative Acts*, COM/2021/206 final, art 3(1).
61   *EU AI Act* (n 17) art 3(1).
62   Ibid recital 12.

Liability Directive, as most recently revised in 2024, also lists 'AI systems' as an example of software.[63]

Obviously, the Australian statutory and judicial recognition of software as 'goods' strongly supports applying the *ACL* product liability regime to AI systems. Thus, if a car owner installs a standalone navigation AI system downloaded from the cloud, and the AI system is defective, the developer could be liable under the product liability regime. However, an unresolved issue arises from the *ACL*'s definition of goods, particularly concerning what constitutes a 'component' of an AI system. The question is whether all components of an AI system should also be treated as 'goods'. For example, the algorithms may be developed by AI software companies, while the datasets used for training could be sourced from third-party data providers. Similarly, cloud infrastructure is often supplied by independent cloud service providers, and digital services that power AI systems, such as updates, storage, and data processing, are usually managed by separate platforms.[64] It is crucial to determine whether these digital services qualify as components of AI systems.

The definition of 'goods' provided in s 2 of the *ACL* is relevant in this regard. This section defines 'goods' as including 'computer software' and 'any component part of, or accessory to, goods'.[65] However, the term 'component' is not defined in the *ACL*, and case law has also been silent on this point. While AI software may rely on various services such as cloud computing services, data storage services, data training services, API (Application Programming Interface) and integration services, or security and monitoring services, it is unclear whether these services qualify as components under s 2 of the *ACL*. Thus, the term component requires clarification to reflect modern products that contain digital components and digital services.[66]

The *EU Product Liability Directive* can assist in clarifying this term. Although component manufacturers have been held liable alongside the final product's manufacturer,[67] under the Directive, the art 4(4) definition of 'component' encompasses intangible elements (as a natural result of recognising software as a finished product), but also covers related services.[68] Article 4(3) of the *EU Product Liability Directive* defines related services as 'a digital service that is integrated into, or interconnected with, a product in such a way that its absence would prevent the product from performing one or more of its functions'. The Directive differentiates 'related services' from others that do not affect product functionality.[69] Nonetheless,

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[63]   *Directive (EU) 2024/2853 of the European Parliament and of the Council of 23 October 2024 on Liability for Defective Products and Repealing Council Directive 85/374/EEC* [2024] OJ L 1/22, recital 13 ('*EU Product Liability Directive*').

[64]   OECD, *Artificial Intelligence in Society* (n 3) 22, 25–6.

[65]   *ACL* (n 8) s 2.

[66]   Hacker (n 58) 12; *EU Product Liability Directive* (n 63) recital 17.

[67]   *Council Directive 85/374/EEC of 25 July 1985 on the Approximation of the Laws, Regulations and Administrative Provisions of the Member States Concerning Liability for Defective Products* [1985] OJ L 210/29 art 3(1) ('*1985 Product Liability Directive*').

[68]   Bernhard A Koch, 'Product Liability on the Way to the Digital Age' (2024) 15(2) *Journal of European Tort Law* 109, 117.

[69]   Shu Li and Michael Faure, 'The Revised *Product Liability Directive*: A Law and Economics Analysis' (2024) 15(2) *Journal of European Tort Law* 140, 156; Shu Li and Béatrice Schütte, 'The Proposal for a Revised *Product Liability Directive*: The Emperor's New Clothes?' (2023) 30(5) *Maastricht Journal of European and Comparative Law* 573, 579.

the inclusion of related services is a '[s]evere broadening'[70] of the scope of product liability.[71] The Directive 'redraws the boundary between service and product'.[72]

The *EU Product Liability Directive* correctly acknowledges that 'integrated or interconnected digital services […] determine the safety of the product just as much as physical or digital components'.[73] As a result, while product liability law should not extend to services as such,[74] liability should be assigned to a party in control of the product's operation and safety,[75] rather than the 'formal categorization' as a service or product,[76] which is ill-suited to emerging technologies.[77] Importantly, by extending product liability to related services, service providers will be motivated to improve the quality of their digital service delivery, particularly where it affects functionality.[78] Additionally, since the final product's manufacturer will share joint and several liability, they are encouraged to evaluate service-related risks before integration.[79] These adjustments ensure that product liability evolves to meet digital era demands.[80] Given these positive developments, it would be beneficial for Australia to adopt similar measures to clarify the definition of component under the *ACL*. Extending the definition to encompass related digital services would provide critical guidance on liability in cases involving multiple parties controlling AI functionality and safety.[81]

The *EU Product Liability Directive* remains ambiguous about what constitutes a 'related service'. Functionality is a key criterion, and there are two possible interpretations.[82] The literal interpretation suggests that any influence on performance qualifies as functional.[83] The second approach, based on objective interpretation, ties functionality to product safety — excluding services that do not affect safety.[84] For instance, digital services that provide discriminatory data may not affect the product's safety and, therefore, may not be recognised as components, exempting their providers from product liability.[85] If Australia follows the Directive's approach, it should clarify the functionality criterion. A related concern is that extending liability to essential services may raise product prices.[86] However,

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[70] Jan De Bruyne, Orian Dheu and Charlotte Ducuing, 'The European Commission's Approach to Extra-Contractual Liability and AI — An Evaluation of the *AI Liability Directive* and the *Revised Product Liability Directive*' (2023) 51 *Computer Law & Security Review* 105894:1–20, 11.

[71] Li and Faure (n 69) 155.

[72] Li and Schütte (n 69) 579.

[73] *EU Product Liability Directive* (n 63) recital 17. See also Hacker (n 58) 12; Li and Faure (n 69) 156; Wagner, 'Liability Rules' (n 50) 203.

[74] *EU Product Liability Directive* (n 63) recital 17.

[75] De Bruyne, Dheu and Ducuing (n 70) 11–12.

[76] Hacker (n 58) 12.

[77] Robert Bradgate, *Consumer Rights in Digital Products* (Research Report, Department for Business, Innovation and Skills (UK), September 2010) 47–9.

[78] Li and Faure (n 69) 156.

[79] Ibid.

[80] Wagner, 'Liability Rules' (n 50) 203.

[81] Gerhard Wagner, 'Next Generation EU Product Liability: For Digital and Other Products' (2024) 15(2) *Journal of European Tort Law* 172, 185 ('Product Liability').

[82] Li and Schütte (n 69) 579.

[83] Hacker (n 58) 12.

[84] *EU Product Liability Directive* (n 63) recital 17.

[85] Li and Schütte (n 69) 579.

[86] Li and Faure (n 69) 156.

this trade-off between stricter standards and increased costs must be assessed based on proportionality and economic feasibility. Some cost increase may be justified where it results in meaningful, proportionate improvements in consumer protection, without rendering products unaffordable or stifling innovation.

Australia can also learn from EU jurisprudence on AI software in the service provision. While Australian case law is silent, EU case law has established a clear position: where damage is caused by a defective product, the *EU Product Liability Directive* applies.[87] However, as the EU Court of Justice emphasised, this does not mean that the Directive extends to defective services themselves.[88] A clarification on this matter would help the *ACL* respond to the complex, multi-party nature of AI-driven technologies.

B   *Can Parties Involved in AI Systems Qualify as Manufacturers?*

The *ACL* product liability framework places responsibility on the manufacturers of the defective goods. Section 7 provides an 'extended definition of manufacturer',[89] covering both actual and deemed manufacturers. This expanded definition enhances the regime's applicability to AI systems by encompassing a wide range of entities involved in the AI lifecycle. Although AI systems do not neatly fit the categories in s 7, traditionally associated with physical goods, a parallel can be drawn. AI developers might be classified as producers or assemblers under s 7(a) due to their role in designing, building, training, testing,[90] or integrating software components (for example, algorithms, data sets, software modules) into a functional AI system. Entities that publicly present themselves as the developers can be considered manufacturers under s 7(b), including those who apply their brand or mark (s 7(c))[91] or permit others to represent them as the manufacturer (s 7(d)). Similarly, importers of AI systems, where the original developer does not have a business presence in Australia, may also be classified as manufacturers under s 7(e).[92] Lastly, if a plaintiff cannot identify the manufacturer of AI systems, they can request this information from the supplier.[93] Failure to respond within 30 days results in the supplier being deemed the manufacturer.[94]

The *ACL* assignment of liability to both actual and deemed manufacturers is a desirable approach to increase the likelihood that victims of defective AI systems can secure compensation and incentivise all parties in the AI lifecycle to ensure safety.[95] Knowing they could be held liable, developers, assemblers, and component

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[87]   *Henning Veedfald v Århus Amtskommune* (C-203/99) [2001] ECR I-3586, I-3595 ('*Henning Veedfald*)*. See also Li and Faure (n 69) 155; Andrea Bertolini, *Artificial Intelligence and Civil Liability* (Study, Policy Department for Citizens' Rights and Constitutional Affairs, European Parliament, PE 621.926, July 2020) 57; Li and Schütte (n 69) 578.

[88]   *Henning Veedfald* (n 87) I-3595. See also Li and Faure (n 69) 155; Bertolini (n 87) 57; Li and Schütte (n 69) 578.

[89]   Paterson (n 41) 456 [12.30].

[90]   OECD, *Artificial Intelligence in Society* (n 3) 25–6.

[91]   *Glendale Chemical* (n 47) 44–6.

[92]   *ACL* (n 8) s 7(e); *Mayes v Australian Cedar Pty Ltd* (2006) ATPR ¶42-119, 45, 038 [8].

[93]   *ACL* (n 8) s 147(1).

[94]   Ibid.

[95]   Li and Schütte (n 69) 588. See also Miriam Buiten, Alexandre de Streel and Martin Peitz, 'The Law and Economics of AI Liability' (2023) 48 *Computer Law & Security Review* 105794:1–20, 1.

providers are more likely to adopt rigorous testing, quality control, and risk management. Downstream parties, such as suppliers or deployers, will also be motivated to vet and identify original manufacturers or developers, ensuring accountability and reducing overall system risk.[96]

The *1985 Product Liability Directive* also adopted a similar extended definition, and its current version expands this list to include authorised representatives,[97] fulfilment service providers,[98] and online platform providers.[99] One of the most novel provisions is the stipulation that any person who modifies a product and subsequently places it on the market or into service is considered a manufacturer.[100] The modification must be substantial and made outside the original manufacturer's control.[101] This is particularly significant in the digital realm, where users frequently alter or extend software.[102] The *ACL* could adopt a similar rule to address post-release AI modifications, ensuring that liability attaches to those exercising meaningful control. However, it is essential to clarify that only substantial modifications give rise to liability, so as not to expose casual users. Since distinguishing what constitutes a substantial modification poses legislative challenges, the responsibility for clarifying this term will fall to the courts, meaning that legal certainty will only be achieved through incremental judicial development.

C   *When Do AI Systems Have a 'Safety Defect'?*

To explore when an AI system may be considered defective for the purposes of product liability, I first examine the notion of 'defect' under the *ACL*. I then critically assess the limitations of the so-called 'consumer expectation test', before proposing a refined approach better suited to AI systems.

1   *The Notion of 'Defect' under the Australian Consumer Law*

Liability under the *ACL* is triggered when a good is found to have a defect. According to s 9(1), goods are defective 'if their safety is not such as persons generally are entitled to expect', considering 'all relevant circumstances', including those specified in s 9(2) such as marketing of the goods, presentation of the goods, reasonably expected use, and time of supply.[103] The *ACL* applies the consumer expectation test, which is based on the reasonable expectations of 'the public at large',[104] rather than the subjective views of the injured party or individuals with specialised knowledge. Objectively assessed expectations may align with actual expectations, but may also be higher, lower, or arise even where the public has no

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96   Li and Faure (n 69) 157.
97   *EU Product Liability Directive* (n 63) art 8(1)(c)(ii).
98   Ibid art 8(1)(c)(iii).
99   Ibid art 8(4).
100   Ibid art 8(2).
101   Ibid.
102   Wagner, 'Liability Rules' (n 50) 215.
103   *ACL* (n 8) s 9(2); Paterson (n 41) 460–4 [12.120]–[12.170].
104   Explanatory Memorandum, Trade Practices Amendment Bill 1992 (Cth) 6 [13]; *Glendale Chemical* (n 47) 47; *Australian Competition and Consumer Commission v Glendale Chemical Products Pty Ltd* (1998) 40 IPR 619, 629; *Graham Barclay Oysters Pty Ltd v Ryan* (2000) 102 FCR 307, 445–6 [533]–[536]; Paterson (n 41) 460 [12.110]. UK consumer law also follows the same approach, see *A v National Blood Authority* [2001] 3 All ER 289, 311 [31].

actual expectation.[105] It is widely accepted that the test does not mandate the goods to be completely risk-free,[106] and the expected safety level depends on factors outlined in s 9(2).[107] The fact that safer goods were later supplied does not, on its own, render earlier ones defective.[108] The *ACL* consumer expectation test shares many key characteristics with the standard set out in art 6 of the EU's *1985 Product Liability Directive*.[109] Its origin, however, can be traced to § 402A of the *Second Restatement of Torts* in the United States ('US'), which establishes liability for 'any product in a defective condition unreasonably dangerous to the user or consumer'.[110]

Studies in Australia and the EU classify defects into three categories: manufacturing defects, design defects, and failure to instruct or warn of non-obvious risks.[111] This classification appears to be influenced largely by US product liability law, particularly the framework in the *Third Restatement of Torts*.[112] Manufacturing defects, where goods are not manufactured as designed, can happen with AI systems. For instance, a bug may arise in a single copy of the software due to an interrupted download, causing part of the AI system to be improperly installed.[113] If an AI system malfunctions due to a deviation from its intended design, product liability law could be applied just as it would for any physical product.[114] Similarly, instructional defects may also arise with AI systems where, for example, the usage instructions are missing, inadequate, or fail to include warnings about non-obvious risks.[115] However, design defects are more challenging to address. They arise when products are manufactured as intended but contain inherent shortcomings due to flawed design, affecting all items within the same product line.[116] Most defects in AI systems stem from design defects rather than manufacturing defects, as is often the case with traditional products.[117] This is because AI systems rely heavily on complex algorithms and design elements like training data, model architecture, and decision-making rules. Flaws in these areas, including programming errors,

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[105] *A v National Blood Authority* (n 104) 311 [31].

[106] *Wilkes v DePuy International Ltd* [2017] 3 All ER 589, 604 [65] ('*Wilkes*').

[107] Paterson (n 41) 460–1 [12.120].

[108] *ACL* (n 8) s 9(3).

[109] *1985 Product Liability Directive* (n 67) art 6. For a discussion of the test, see Vibe Ulfbeck, 'Product Liability Law and AI: Revival or Death of Product Liability Law' in Ernest Lim and Phillip Morgan (eds) *The Cambridge Handbook of Private Law and Artificial Intelligence* (Cambridge University Press, 2024) 206, 207–8.

[110] See American Law Institute, *Restatement (Second) of Torts* (1965) § 402A, cmts (g),(i). See also Aaron D Twerski, 'An Essay on the Quieting of Products Liability Law' (2020) 105(4) *Cornell Law Review* 1211, 1214; Duncan Fairgrieve and Richard Goldberg, *Product Liability* (Oxford University Press, 3rd ed, 2020) 333 [10.29].

[111] Paterson (n 41) 340 [8.660]; Latimer (n 39) 530–1; Wagner, 'Product Liability' (n 81) 191–2.

[112] American Law Institute, *Restatement (Third) of Torts: Products Liability* (1998) §§ 2(a)–(c).

[113] Erica Palmerini, 'AI Systems and the Issue of Liability in the European and National Regulatory Strategies' in Phillip Morgan (ed), *Tort Liability and Autonomous Systems Accidents: Common and Civil Law Perspectives* (Edward Elgar, 2023) 63, 76; Hacker (n 58) 15.

[114] Omri Rachum-Twaig, 'Whose Robot Is It Anyway?: Liability for Artificial-Intelligence-Based Robots' 2020(4) *University of Illinois Law Review* 1141, 1155.

[115] Hacker (n 58) 15.

[116] Buiten (n 40) 253; Ulfbeck (n 109) 213.

[117] Buiten (n 40) 257; Ulfbeck (n 109) 213; Hacker (n 58) 15; Rachum-Twaig (n 114) 1155; Alan Butler, 'Products Liability and the Internet of (Insecure) Things: Should Manufacturers Be Liable for Damage Caused by Hacked Devices?' (2017) 50(4) *University of Michigan Journal of Law Reform* 913, 917.

inadequate training datasets,[118] or security vulnerabilities[119] would directly impact system performance. Moreover, unlike traditional products, AI systems involve standardised software and hardware with minimal manufacturing variability, making manufacturing defects rare. Defects are more likely to result from design than production.[120]

Thus, it is crucial to address design defects in AI systems, as they impact not just one unit but an entire series of products.[121] However, such defects are often difficult to prove, as they require courts to assess whether a product's intended design falls below an acceptable safety standard, which is especially complex for emerging technologies like AI.[122] In the following discussion, I consider whether the consumer expectation test under the *ACL* can serve as an adequate benchmark for assessing such defects.

2 *Difficulties with the Consumer Expectation Test*

While the consumer expectation test has traditionally been used to assess product safety defects, its application to AI systems presents several challenges. These challenges are rooted in the test's inherent weaknesses, which are further amplified by the complexity and novelty of AI technologies. Here, I outline the key obstacles in evaluating AI systems' defects using this test.

First, the consumer expectation test has been widely critiqued for its vagueness and inability to adequately address design defects in complex systems.[123] Scholars have pointed out that the test operates as an 'open' concept,[124] largely devoid of substantive content.[125] The standard of safety that consumers are 'entitled to expect' is determined as an exercise of judicial discretion, taking into account various factors such as the marketing and presentation of the product, its reasonably expected use, and the time of supply.[126] While the incorporation of such factors helps articulate what the standard entails, and judicial discretion is necessary to keep the provision adaptable across product types, these flexibilities also contribute to the test's indeterminacy, especially when applied to unfamiliar or opaque technologies. The test presupposes that consumers have formed expectations about safety and that such expectations can be objectively discerned by courts. However, in the case of complex systems 'where the alleged defect is of an esoteric or complex nature',

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[118] Ulfbeck (n 109) 213–20.
[119] Butler (n 117) 926–7.
[120] Buiten (n 40) 257–8.
[121] Gerhard Wagner, 'Robot, Inc: Personhood for Autonomous Systems?' (2019) 88(2) *Fordham Law Review* 591, 604–5 ('Personhood'); Wagner, 'Product Liability' (n 81) 192.
[122] Wagner, 'Product Liability' (n 81) 192; Butler (n 117) 927.
[123] Keith N Hylton, 'The Law and Economics of Products Liability' (2013) 88(5) *Notre Dame Law Review* 2457, 2491; De Bruyne and Dheu (n 27) 41; Hacker (n 58) 14.
[124] Gitta Veldt, 'The New Product Liability Proposal – Fit for the Digital Age or in Need of Shaping Up? An Analysis of the Draft Product Liability Directive' (2023) 12(1) *Journal of European Consumer and Market Law* 24, 26.
[125] Hacker (n 58) 14.
[126] *ACL* (n 8) s 9(2).

consumers may have 'no expectations of the product whatsoever'.[127] Owen, for example, observes that 'in automotive crashworthiness situations, consumers typically have "no idea" how safely their vehicles should have performed'.[128] A similar concern arises in software defect claims, where consumers are often unaware of how the software works, its role in the digital ecosystem, or the implications of embedded vulnerabilities.[129]

AI technologies, particularly those with autonomous decision-making capabilities, are inherently complex and opaque unlike many traditional products, whose mechanisms and potential defects are transparent. AI systems operate through layers of algorithms, data processing, and self-learning functions. For instance, an AI system used in healthcare may analyse vast amounts of data to provide diagnostic recommendations. If the AI system makes an incorrect recommendation because of a defect in its design, consumers are unlikely to have anticipated such an outcome. Thus, as with Internet of Things ('IoT') devices,[130] it becomes unclear how a reasonable safety expectation can be meaningfully determined. In such cases, courts will be left with 'a wide margin of appreciation',[131] increasing the risk of inconsistent outcomes and legal uncertainty for manufacturers, regulators, and consumers. Judicial reasoning may rely on subjective views and general experiences, rather than concrete evidence of consumer perception.[132]

Second, even when consumers do form safety expectations in relation to complex systems like IoT devices or AI, these expectations may be inaccurate.[133] Consumers may place excessive trust in AI's capabilities and safety.[134] As Mackie observes, many consumers are influenced by the 'hype' surrounding autonomous vehicles, leading them to expect flawless safety standards.[135] Recent Tesla crashes, where drivers relied too heavily on the vehicle's AI and neglected to remain attentive, demonstrate how public trust in AI can outpace its actual performance.[136] Unrealistically high safety expectations create significant challenges in applying the consumer expectation test. Although the consumer expectation test is not assessed based on the actual knowledge or expectation of individual consumers, widespread misconceptions about AI safety complicate the courts' task of discerning what consumers are 'entitled to expect'.[137]

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[127] Fairgrieve and Goldberg (n 110) 335 [10.31]. See also Gerhard Wagner, 'Robot Liability' (Working Paper No 2, Research Institute for Law and Digital Transformation, Humboldt-Universität Zu Berlin, 2019) 11 ('Robot Liability').

[128] David G Owen, 'Design Defects' (2008) 73(2) *Missouri Law Review* 291, 349.

[129] Butler (n 117) 927. See also Evana Wright, David Lindsay and Genevieve Wilkinson, 'Who is Responsible for an Internet of Unsafe Things under the *Australian Consumer Law*' (2023) 31(1) *Australian Journal of Competition and Consumer Law* 16, 20.

[130] Wright, Lindsay and Wilkinson (n 129) 20.

[131] De Bruyne and Dheu (n 27) 41.

[132] Fairgrieve and Goldberg (n 110) 335 [10.31] n 153, 338–9 [10.39].

[133] Buiten (n 40) 259; Wagner, 'Robot Liability' (n 127) 11.

[134] Marija Karanikić Mirić, 'Product Liability Reform in the EU' (2023) 7 *EU and Comparative Law Issues and Challenges Series (ECLIC)* 383, 399.

[135] Mackie (n 32) 1326, quoting David C Vladeck, 'Machines Without Principals: Liability Rules and Artificial Intelligence' (2014) 89(1) *Washington Law Review* 117, 136.

[136] Buiten (n 40) 259.

[137] Mackie (n 32) 1326.

Since the consumer expectation test under s 9 of the *ACL* lacks objective criteria to distinguish reasonable from unreasonable expectations, courts have consistently turned to industry and regulatory standards to give the test objective meaning. In *Bamber v Hartman Pacific Pty Ltd*, the NSW Court of Appeal accepted that the ladder's failure to conform to Australian Standard (AS) 1892.1 provided compelling evidence of a safety defect.[138] Similarly, in *Ethicon Sàrl v Gill* ('*Ethicon*'), the Full Federal Court held that non-compliance with mandatory or internationally recognised standards, such as Conformité Européenne ('CE') marking requirements, is a relevant factor in assessing whether goods fall short of what consumers are entitled to expect.[139] The Court found that consumers are entitled to expect that medical devices bearing CE marking comply with the regulatory and technical standards it represents.[140] Though not determinative, failure to meet CE obligations — such as clinical evaluation or post-market surveillance — supported the finding of a defect or defects.[141]

This reliance on standards remains a viable reference point in the context of AI, especially in regulated sectors. In Australia, several non-binding AI safety frameworks have emerged,[142] and progressed towards enforceable guardrails for high-risk AI applications,[143] offering courts useful reference points for interpreting reasonable consumer expectations. In some sectors, enforceable technical standards already exist. For example, the *Australian Design Rules* already mandate certain vehicle safety features, such as Advanced Emergency Braking Systems, which often incorporate AI functionalities.[144] The proposed *Automated Vehicle Safety Law*, jointly developed by federal and state authorities, will establish a nationally consistent regulatory framework for automated vehicles.[145] Similarly, in healthcare, software-based medical devices are already subject to the Therapeutic Goods Administration's risk classification system.[146] These standards can inform what safety consumers may reasonably expect from the regulated AI systems.

However, challenges remain in less regulated contexts where courts lack specific standards to assess what consumers can reasonably expect. Even in highly regulated domains like automated vehicles, standards are often insufficient or

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[138] *Bamber v Hartman Pacific Pty Ltd* [2018] NSWCA 248, [94]–[98].

[139] *Ethicon Sàrl v Gill* (2021) 288 FCR 338, 487–8 [691]–[694] ('*Ethicon*').

[140] Ibid 483–4 [674]–[676], 488 [693].

[141] Ibid 386 [258], [264], 483–4 [673]–[674], 488 [694].

[142] Department of Industry, Science and Resources (Cth), *Voluntary AI Safety Standard* (September 2024); Department of Industry, Science and Resources (Cth), *Australia's AI Ethics Principles* (updated October 2024).

[143] Department of Industry, Science and Resources (Cth), *Safe and Responsible AI in Australia* (Discussion Paper, June 2023).

[144] *Vehicle Standard (Australian Design Rule 98/00 – Advanced Emergency Braking for Passenger Vehicles and Light Goods Vehicles) 2021* (Cth).

[145] National Transport Commission, *A National In-Service Safety Regulatory Framework for Automated Vehicles* (Policy Paper, May 2021) 8–75.

[146] Therapeutic Goods Administration, *Classifying Active Medical Devices in Australia (Including Software-Based Medical Devices)* (Guidance, last updated 27 September 2024) <https://www.tga.gov.au/resources/guidance/classifying-active-medical-devices-australia-including-software-based-medical-devices>.

technically contested.[147] For example, in the 2018 Uber fatal crash, Arizona's regulatory framework lacked specific requirements for testing automated driving systems ('ADS') with an operator,[148] and the US National Highway Traffic Safety Administration's voluntary guidelines failed to mandate robust ADS scenario testing, contributing to the system's inability to classify a pedestrian.[149] Such gaps illustrate broader struggles, also faced in Australia, to keep standards aligned with machine learning developments.[150] Thus, while useful, such standards are not always definitive or comprehensive legal benchmarks.

In applying the test, courts have also emphasised the adequacy of warning. In *Merck Sharp & Dohme (Australia) Pty Ltd v Peterson* ('*Merck*'), the Full Federal Court of Australia held that a failure to warn of serious, albeit rare, risks may establish a defect.[151] Likewise, in *Gill v Ethicon Sàrl (No 5)* ('*Gill*'), Katzmann J found that a product may be defective not merely because of physical faults, but due to the absence of adequate warnings about known risks, particularly where marketing emphasises safety.[152] The same emphasis on warnings can also be found in *Ethicon*.[153] However, the test's heavy reliance on the presence or adequacy of warnings may be ill-suited for AI. AI warnings — typically technical documentation or disclaimers — may be incomprehensible to non-experts and are unlikely to meaningfully inform consumer expectations. Besides warnings, the role of intermediaries is also considered by courts. The Full Federal Court in *Ethicon* reaffirmed that the consumer expectation test requires consideration of the totality of circumstances, including how information is communicated to medical intermediaries like surgeons, who influence consumer reliance.[154] Nevertheless, the role of intermediaries in AI systems (for example, data scientists, platform engineers, or integrators) is less defined than surgeons in *Ethicon*[155] or pharmacists in *Merck*.[156] Thus, the consumer expectation test in s 9 may face significant challenges when applied to complex products such as AI systems.

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[147] Ronald Schnitzer, Lennart Kilian, Simon Roessner, Konstantinos Theodorou and Sonja Zillner, 'Landscape of AI Safety Concerns: A Methodology to Support Safety Assurance for AI-Based Autonomous Systems' in *2024 8th International Conference on System Reliability and Safety (ICSRS 2024)* (Institute of Electrical and Electronics Engineers, 2024) 501 <https://doi.org/10.1109/ICSRS63046.2024.10927556>; Simeon C Calvert and Arkady Zgonnikov, 'A Lack of Meaningful Human Control for Automated Vehicles: Pressing Issues for Deployment' (2025) 6 *Frontiers in Future Transportation* 1534157: 1–6, 3–5 <https://doi.org/10.3389/ffutr.2025.1534157>.

[148] Stuart Ballingall, Majid Sarvi and Peter Sweatman, 'Safety Assurance for Automated Systems in Transport: A Collective Case Study of Real-World Fatal Crashes' (2025) 92 *Journal of Safety Research* 27, 31.

[149] Ibid.

[150] Wesley Lim, Sean Lee, Billy Sung and Sophie Cronin, 'Is Australia Ready for Autonomous Vehicles? Examining the Factors Influencing AV Adoption through Expert Interviews' (2024) 32(4) *Australasian Marketing Journal* 308, 317.

[151] *Merck Sharp & Dohme (Australia) Pty Ltd v Peterson* (2011) 196 FCR 145, 197–200 [191]–[198] ('*Merck*').

[152] *Gill v Ethicon Sàrl (No 5)* [2019] FCA 1905, [3172]–[3185], [3453] ('*Gill*').

[153] *Ethicon* (n 139) 473–4 [642].

[154] Ibid 462–4 [602]–[605].

[155] Ibid.

[156] *Merck* (n 151) 198 [191]–[194].

There is, however, a possible critique that, over time, as AI technology matures and becomes more prevalent, the public may develop more accurate and reasonable safety expectations. In this scenario, the vagueness of the test, its limitations in dealing with complex design systems, and public misconceptions could diminish.[157] However, such a view overlooks a structural mismatch between consumer expectations and the nature of AI technology: unlike traditional physical products, most AI systems are opaque, probabilistic 'black boxes' whose decision logic is unintelligible to ordinary users. It remains unlikely that consumers can assess embedded design risks. Thus, public familiarity alone cannot bridge the gap between expectations and AI operation.

In the unlikely scenario that consumers do form accurate safety expectations, the test may then fail in another way. It has long been criticised for shielding consumers only from unforeseen risks, while denying recovery where dangers are deemed apparent or inherent.[158] In such cases, courts may place the burden on users to remain vigilant and assume responsibility for any risks they are taken to have accepted.[159] This creates a troubling dynamic: the more obvious the danger, the less likely the consumer is to succeed — even if the manufacturer could have addressed the risk through reasonable and cost-effective design improvements.[160] Until widely accepted AI safety standards emerge to deter manufacturers from avoiding reasonable design improvements, users will remain exposed to foreseeable but preventable risks. This concern is heightened in the AI context. Technologies such as autonomous vehicles, healthcare diagnostics, or service robots often exhibit systematic failure patterns.[161] For example, studies show autonomous vehicles are significantly more likely to cause accidents at dawn or dusk (5.25 times higher risk) and during turning manoeuvres (1.98 times higher risk).[162] If such risks become widely known, courts may deem them foreseeable and exclude them from protection. This would potentially enable manufacturers to reduce liability not by improving design, but by pre-emptively disclosing foreseeable risks.

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[157] Buiten (n 40) 260.

[158] Fairgrieve and Goldberg (n 110) 335 [10.31]; Owen, 'Design Defects' (n 128) 304–5.

[159] Fairgrieve and Goldberg (n 110) 359 [10.87].

[160] Ibid.

[161] See, eg, Morgan, 'Tort Liability and Autonomous Systems Accidents Challenges and Future Developments' (n 7) 6–10. Zhiwei Sun, Miao Lin, Wentao Chen, Bing Dai, Pengfei Ying & Qing Zhou, 'A Case Study of Unavoidable Accidents of Autonomous Vehicles' (2024) 25(1) *Traffic Injury Prevention* 8 <https://doi.org/10.1080/15389588.2023.2255333>; Maryam Moogha, Austin M Stroud, Dong Whi Yoo, Barbara A Barry, Alyssa A Grimshaw, Joseph S Ross, Xuan Zhu and Jennifer E Miller, 'Trustworthy and Ethical AI-Enabled Cardiovascular Care: A Rapid Review' (2024) 24 *BMC Medical Informatics and Decision Making* 247:1–12 <https://doi.org/10.1186/s12911-024-02653-6>; Nathan E Sanders, Elif Şener and Karen B Chen, 'Robot-Related Injuries in the Workplace: An Analysis of OSHA Severe Injury Reports' (2024) 121 *Applied Ergonomics* 104324:1–14 <https://doi.org/10.1016/j.apergo.2024.104324>.

[162] Mohamed Abdel-Aty and Shengxuan Ding, 'A Matched Case-Control Analysis of Autonomous vs Human-Driven Vehicle Accidents' (2024) 15(1) *Nature Communications* 4931:1–12 <https://doi.org/10.1038/s41467-024-48526-4>.

3   *The Way Forward for Australian Product Liability Law*

Given the consumer expectation test's vagueness and its inability to address complex designs and obvious dangers, Australian product liability law needs a more effective framework to evaluate AI systems' defects. The risk-utility test, as developed in the US legal system, offers promising lessons in this regard. I explore whether, and how, Australia can adopt the risk-utility test to create a rational and structured approach for assessing AI systems' defects.

Despite the dominance of the consumer expectation test in the 1960s and 1970s, US case law began to recognise the advantages of the risk-utility approach.[163] By the early 1980s, many US courts had already replaced the consumer expectation test with the risk-utility test.[164] The adoption of the risk-utility test in the *Third Restatement of Torts* in 1998 marked a definitive shift away from the consumer expectation test.[165] Since then, the risk-utility test has become 'America's dominant test for design defectiveness'.[166] Owen has noted that '[a] product's design is "defective" under a risk-utility test if the costs of avoiding a particular hazard are foreseeably less than the resulting safety benefits'.[167] The test's core is a cost-benefit analysis of feasible design alternatives.[168] This analysis is confined to foreseeable factors[169] and based on the product line over a substantial period of time.[170] A wide array of factors may be considered to determine if an alternative design was reasonable and, if so, whether not adopting it made a product 'not reasonably safe'.[171] These factors include:

- the magnitude and likelihood of foreseeable risks of harm;

- instructions and warnings, consumer expectations;

- the pros and cons of the original and alternative designs;

- the potential effects of the alternative;

- the product's utility;

- the range of consumer choices;

- the financial costs of implementing the improved design; and

- relevant industry codes and standards.[172]

The judge must weigh these factors in relation to both the accident product and the alternative design to decide whether a product is defective.[173]

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163   Owen, 'Design Defects' (n 128) 307–9; Fairgrieve and Goldberg (n 110) 388 [11.19].
164   Owen, 'Design Defects' (n 128) 307–9; Fairgrieve and Goldberg (n 110) 388 [11.19].
165   *Restatement (Third) of Torts: Products Liability* (n 112) §§ 1–2; David G Owen, 'Toward a Proper Test for Design Defectiveness: "Micro Balancing" Costs and Benefits' (1997) 75(7) *Texas Law Review* 1661, 1662 ('Proper Test').
166   Owen, 'Design Defects' (n 128) 309.
167   Ibid 311.
168   Ibid 321.
169   Ibid 311, citing *Coleman v Cintas Sales Corp*, 40 SW 3d 544, 549 (Tex App, 2001); *Restatement (Third) of Torts: Products Liability* (n 112) § 2(b) cmt (a).
170   Owen, 'Design Defects' (n 128) 311.
171   *Restatement (Third) of Torts: Products Liability* (n 112) § 2 cmt (f).
172   Ibid.
173   Owen, 'Design Defects' (n 128) 311.

There is broad academic consensus that the risk-utility test is superior to the consumer expectation test in assessing design defectiveness.[174] This is primarily because it provides a rational and objective standard to assess design defectiveness.[175] Specifically, 'failure to adopt a safety feature is wrongful if the untaken feature should have been expected to produce more good than harm'.[176] Grounded on theoretical foundations,[177] primarily the utilitarian theory,[178] the risk-utility test has evolved into a structured approach commonly used for evaluating product defects. In complex design cases, where consumer expectations are usually absent, vague or inaccurate, the risk-utility test remains effective. Rather than discerning public expectation, it evaluates defectiveness through an objective assessment of the costs and benefits of the alternative design. This makes it especially appropriate to handle complex design cases.[179] While the consumer expectation test may fall short in addressing obvious dangers, the risk-utility test can more effectively handle such cases, providing better protection to users[180] and discouraging manufacturers from neglecting cost-effective safety enhancements.[181]

Moreover, the risk-utility test can provide a useful approach for determining the level of safety that best benefits the society.[182] A significant difficulty with the consumer expectation test lies in its lack of guidance on 'which precautions the public is entitled to expect'.[183] Maximum safety is clearly impractical.[184] While courts, as discussed above in Part III(C)(2), have developed interpretive tools to give content to the consumer expectation test, these do not fully overcome its indeterminacy—especially in complex, opaque AI contexts. This is precisely where the risk-utility test demonstrates its value by providing a 'rational framework' to decide the level of safety that the public can reasonably expect from a product.[185] As specified in the *Third Restatement of Torts*, the risk-utility test evaluates 'whether a reasonable alternative design would, at reasonable cost, have reduced the foreseeable risks of harm posed by the product and, if so, whether the omission of the alternative design [...] rendered the product not reasonably safe'.[186] Rather than demanding absolute safety, the risk-utility test seeks an optimal level of safety,[187] recognising that '[s]ociety benefits most when the right, or optimal, amount of product safety is achieved'.[188] In this way, it answers society's entitlement to product safety in a

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[174] Buiten (n 40) 261; Wagner, 'Product Liability' (n 81) 193–4; Owen, 'Proper Test' (n 165) 1661; Hacker (n 58) 16–17.

[175] Wagner, 'Product Liability' (n 81) 193–4; David G Owen, *Products Liability Law* (West Academic Publishing, 4th ed, 2022) 308; Owen, 'Proper Test' (n 165) 1661–2; Hacker (n 58) 16–17.

[176] Owen, *Products Liability Law* (n 175) 308.

[177] Fairgrieve and Goldberg (n 110) 339 [10.41].

[178] David G Owen, 'The Moral Foundations of Products Liability Law: Towards First Principles' (1993) 68(3) *Notre Dame Law Review* 427, 477– 8.

[179] Mackie (n 32) 1326.

[180] Fairgrieve and Goldberg (n 110) 359 [10.87], citing *Vincer v Esther Williams All–Aluminum Swimming Pool Co*, 230 NW 2d 794 (Wis, 1975).

[181] Owen, 'Design Defects' (n 128) 305.

[182] Wagner, 'Product Liability' (n 81) 193. See also Chagal-Feferkorn (n 52) 80–1.

[183] Wagner, 'Product Liability' (n 81) 193 (emphasis omitted).

[184] Ibid.

[185] Ibid.

[186] *Restatement (Third) of Torts: Products Liability* (n 112) § 2, cmt (d).

[187] Chagal-Feferkorn (n 52) 80–1; Owen, 'Design Defects' (n 128) 362.

[188] *Restatement (Third) of Torts: Products Liability* (n 112) § 2, cmt (a).

sensible and practical manner. Unsurprisingly, the influence of the risk-utility test has since extended beyond its US origins. For instance, the German Federal court of Justice has embraced this approach,[189] ruling that risk-utility analysis is a critical component of the EU standard for design defects.[190] Similarly, the High Court of England and Wales has shown support for the 'risk-benefit' analysis.[191] In the context of AI systems, scholars have also widely recognised the suitability of the risk-utility test in this domain.[192]

Given these developments, it would be sensible for Australia to consider adopting the risk-utility test, especially in cases involving complex systems like AI. Although the *ACL* currently may not rule out such analysis, given its requirements to consider 'all relevant circumstances' in determining product safety,[193] courts have yet to adopt the risk-utility reasoning. For instance, in *Merck*, the Federal Court held that serious but rare risks may render a product defective if not adequately disclosed, but did not consider whether those risks could have been reduced through feasible alternative designs.[194] Applying the risk-utility test in such contexts, especially where no clear technical or regulatory standards are firmly established yet, would have enabled a more structured, design-focused analysis of risk severity, utility, and design feasibility, better reflecting the complex trade-offs involved in emerging technologies. It would also promote legal consistency, incentivise practical safety innovation, and ground liability in rational assessments of avoidable harm, rather than vague consumer expectations.

Despite the rational basis discussed above, the risk-utility test is not without challenges. One difficulty lies in the complexity of evaluating risk and utility.[195] This, however, can be mitigated by formulating a 'clear, accurate, and workable'[196] test that addresses the fundamental question as to '*what* should be balanced against

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[189] Bundesgerichtshof [German Federal Court of Justice], VI ZR 107/08, 16 June 2009, Zur Haftung eines Fahrzeugherstellers für die Fehlauslösung von Airbags [Regarding the liability of a vehicle manufacturer for the incorrect deployment of airbags], reported in (2009) 181 BGHZ 253, [18] ('Bundesgerichtshof VI ZR 107/08'). For a more recent application in the medical context, see Bundesgerichtshof [German Federal Court of Justice], VI ZR 82/22, 1 August 2023, Zum Vorliegen eines Produktfehlers bei einem gebrochenen Keramikinlay einer Hüftendoprothese [Regarding the existence of a product defect in the case of a fractured ceramic inlay of a hip total endoprosthesis], [35] (confirming that the assessment of a defect requires a weighing of the 'nature and extent of the risks, the probability of their realisation, and the benefit associated with the product' [quote translated from German to English]). See also Wagner, 'Robot Liability' (n 127) 11.

[190] Bundesgerichtshof VI ZR 107/08 (n 189) [17]; Hacker (n 58) 16–17.

[191] *Wilkes* (n 106) 593–4 [13]–[16], 604 [66]–[67], affirmed in *Gee v DePuy International Ltd* [2018] EWHC 1208 (QB), [144]–[148]. More recently, the United Kingdom Supreme Court in *Hastings v Finsbury Orthopaedics Ltd* cited *Wilkes* (n 106) in reaffirming that defectiveness must be assessed by reference to all relevant circumstances, including 'risks associated with a product', without endorsing an explicit risk-benefit balancing exercise: *Hastings v Finsbury Orthopaedics Ltd* [2023] 1 All ER 885, 890 [15]. See also Wagner, 'Product Liability' (n 81) 193.

[192] Mackie (n 32) 1326; Wagner, 'Product Liability' (n 81) 193–4; Buiten (n 40) 253–4; Christopher Carlsen and Julie-Anne Tarr, 'Product Liability' in Anthony A Tarr, Julie-Anne Tarr, Maurice Thompson and Jeffrey Ellis (eds), *Drone Law and Policy* (Taylor & Francis, 2021) 252, 258 <https://doi.org/10.4324/9781003028031>; Hacker (n 58) 16–17; Wagner, 'Personhood' (n 121) 605; Ulfbeck (n 109) 211.

[193] *ACL* (n 8) s 9(2).

[194] *Merck* (n 151) 200–1 [198]–[202].

[195] See Alistair M Clark, *Product Liability* (Sweet & Maxwell, 1989) 33; Chagal-Feferkorn (n 52) 80–1.

[196] Owen, 'Proper Test' (n 165) 1677.

what'.[197] An 'over-broad'[198] formulation of the test that relies on a 'global macro-balance'[199] (that is, a sweeping comparison of all conceivable risks and benefits of a product in the abstract) should be avoided because it is 'exceedingly complex, multi-layered […] and prone to error in a court of law'.[200] Courts are generally ill-equipped to evaluate the overall appropriateness of design choices in aggregate, and only manufacturers, markets, lawmakers, and safety regulators should perform such macro-level assessments.[201] However, this does not imply that design decisions are immune from judicial scrutiny.[202] Rather, courts should focus on the narrow 'micro-balance' that weighs the specific costs and benefits associated with the proposed alternative design.[203] The benefits of a proposed alternative design are limited to the aggregate safety benefits of preventing foreseeable accidents similar to the plaintiff's experience, while the costs may include: '(1) the monetary costs of adopting the alternative design for all such products; (2) any loss of usefulness in the product that the design alteration may cause; and (3) any new dangers that the design feature may introduce.'[204] This micro-approach can provide courts with a balanced, practical standard that preserves analytical rigor while simplifying complex cost-benefit considerations.

The risk-utility test has been critiqued for importing negligence into product liability.[205] It is true that the test implies a negligence-like inquiry, requiring plaintiffs to show that foreseeable risks could have been reduced through a feasible, safer alternative.[206] It has been suggested that the EU 'consciously avoided' the risk-utility test,[207] to prevent favouring producers.[208] However, in terms of consumer protection, the two tests might not be as fundamentally different as critics suggest. While the consumer expectation test does not require fault from manufacturers, consumers still need to prove 'defect', and courts must determine the standard of safety that consumers can realistically expect. Consumers are thus protected only from harm caused by defects — not from all harm. As Wendel has suggested, this entails a negligence element within the consumer expectation test itself.[209]

Importantly, it is arguable that the consumer expectation test already embeds a form of 'a cost/benefit-calculation' as one of the factors in its application.[210]

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[197] Ibid 1662 (emphasis in original).
[198] Owen, 'Design Defects' (n 128) 317.
[199] Owen, 'Proper Test' (n 165) 1698.
[200] Ibid 1676.
[201] Ibid.
[202] Ibid.
[203] Ibid.
[204] Owen, 'Design Defects' (n 128) 327.
[205] Butler (n 117) 917; Rachum-Twaig (n 114) 1156.
[206] Chagal-Feferkorn (n 52) 80; Owen, 'Design Defects' (n 128) 326; Buiten (n 40) 253; Fairgrieve and Goldberg (n 110) 340 [10.42].
[207] Fairgrieve and Goldberg (n 110) 340 [10.42].
[208] Hans Claudius Taschner, 'Product Liability: Basic Problems in a Comparative Law Perspective' in Duncan Fairgrieve (ed), *Product Liability in Comparative Perspective* (Cambridge University Press, 2005) 155, 160.
[209] W Bradley Wendel, 'Technological Solutions to Human Error and How They Can Kill You: Understanding the Boeing 737 Max Products Liability Litigation' (2019) 84(3) *Journal of Air Law and Commerce* 379, 391. See also Daily Wuyts, 'The *Product Liability Directive* – More than Two Decades of Defective Products in Europe' (2014) 5(1) *Journal of European Tort Law* 1.
[210] Wagner, 'Liability Rules' (n 50) 205.

Determining defectiveness in practice inherently involves a 'trade-off' similar to that in negligence,[211] where the 'potential benefits' of a product, as specified in *Wilkes v DePuy International Ltd*, 'have to be balanced against its risks'.[212] Similarly, Lord Griffiths, De Val and Dormer have observed that although English judges have not explicitly adopted a cost-benefit approach, they have engaged in an 'analogous' balancing process when assessing safety.[213] Accordingly, what rational consumers are said to expect often mirrors the outcome of a cost-benefit analysis.[214] This was made explicit in *Seattle-First National Bank v Tabert*, where the Supreme Court of Washington held that consumer expectations should be assessed with reference to factors such as the product's cost, the gravity of potential harm, and the feasibility of risk mitigation.[215]

Thus, incorporating a balancing approach through the risk-utility test does not undermine strict liability. Rather, it offers a structured framework for courts to assess design decisions in complex cases without relying on the vague and sometimes fictional notion of public expectations. The targeted use of the risk-utility test within the strict liability framework is confined to design assessment in complex cases, not to a fault-centric inquiry as in negligence law. Moreover, such a framework can promote efficiency.[216] Encouraging users to exercise reasonable caution may, in some cases, be more effective than requiring manufacturers to implement costly design changes with limited impact on risk reduction. For instance, a car owner who drives responsibly mitigates accident risk more efficiently than marginal safety improvements alone. This does not shift the burden onto consumers; rather, it recognises that in certain contexts, user behaviour contributes to safety, while the core obligation to ensure reasonably safe design remains with the manufacturer as the more efficient insurers in the product liability framework. In this way, the risk-utility test supports 'a fair apportionment of the risks'[217] by promoting practical design improvements while acknowledging the practical role of user behaviour in specific circumstances.[218]

Although the risk-utility test offers numerous advantages, the consumer expectation test retains significant value. This test is particularly effective in simple design defect cases where average consumers can easily form safety expectations.[219] For such products, the consumer expectation test offers a standard, informing both potential plaintiffs and defendants of the likely litigation outcomes.[220] This predictability benefits producers, offering them a reliable gauge of potential legal risks that the more complex risk-utility test does not always provide.[221] The continued application of the consumer expectation test, even as many courts

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211 Jane Stapleton, *Product Liability* (Cambridge University Press, 1994) 236.
212 *Wilkes* (n 106) 604 [65].
213 Lord Griffiths, Peter De Val and RJ Dormer, 'Developments in English Product Liability Law: A Comparison with the American System' (1988) 62 (2–3) *Tulane Law Review* 353, 382.
214 Wagner, 'Personhood' (n 121) 605.
215 *Seattle-First National Bank v Tabert*, 542 P 2d 774, 779 [6] (Wash, 1975).
216 Buiten (n 40) 253–4.
217 *1985 Product Liability Directive* (n 67) recital 2.
218 Buiten (n 40) 253–4.
219 Hylton (n 123) 2511.
220 Ibid.
221 Ibid.

increasingly prefer the risk-utility approach, can be attributed to this 'predictability value'.[222] Importantly, much criticism of the consumer expectation test targets the US version's subjectivity, as shown in *Jarke v Jackson Products*.[223] In that decision, critiqued by Owen, the Appellate Court of Illinois relied heavily on the plaintiff's subjective awareness of obvious dangers and found no defect for an obvious welding mask risk, but sent the case back for trial on a more subtle issue: whether the mask's physical rim was defectively shaped such that it channelled molten metal directly into the welder's ear.[224] In contrast, the EU version of the consumer expectation test, largely shared by Australia,[225] is more objective. Courts, like the High Court of England and Wales in *A v National Blood Authority*, position judges as 'an informed representative of the public' to objectively evaluate what level of safety the public is entitled to expect.[226] Thus, instead of abandoning the consumer expectation test entirely, a blended approach that combines both the risk-utility and consumer expectation tests might offer the best solution for Australia. The US experience demonstrates that such a combination is feasible[227] and, in the words of Owen, has 'logical appeal' as it can mitigate the limitations of each test while preserving their respective strengths.[228]

Under the combined approach, however, an effective allocation between the two tests is essential, and US case law provides valuable insights. In *Barker v Lull Engineering Co*, the Supreme Court of California established a dual test, deeming a high-clearance loader defective if it failed to meet ordinary consumer safety expectations or if the design's risks outweighed its benefits.[229] This approach was refined in *Soule v General Motors Corp*, where the Supreme Court of California restricted the consumer expectations test to cases involving simple designs (such as a car door failing in a crash) where ordinary users can infer defectiveness from everyday experience, but mandated risk-utility for complex designs (like vehicle stability) necessitating expert testimony.[230] Moreover, for simple design cases involving obvious dangers, the risk-utility test, as clarified in *Potter v Chicago Pneumatic Tool Co* ('*Potter*'), should be employed to address the consumer expectation test's limitations in such scenarios.[231] Importantly, in *Potter* the Supreme Court of Connecticut also confirmed that when the consumer expectation test fails to provide a rational basis for liability, transitioning to the risk-utility test becomes necessary.[232] Commentators believe that combining the two tests in this manner may provide an 'optimal standard' for evaluating design defects.[233] Unsurprisingly, some scholars have suggested that this dual approach should be

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[222]   Ibid 2512.

[223]   *Jarke v Jackson Products*, 631 NE 2d 233, 239 (Ill App Ct, 1994).

[224]   Owen, 'Design Defects' (n 128) 303–6.

[225]   Harland (n 41) 342–5.

[226]   *A v National Blood Authority* (n 104) 311 [31].

[227]   Owen, 'Design Defects' (n 128) 336–53; Fairgrieve and Goldberg (n 110) 398–400 [11.39]–[11.42].

[228]   Owen, 'Design Defects' (n 128) 342.

[229]   *Barker v Lull Engineering Co Inc*, 573 P 2d 443, 457–8 (Cal Sup Ct, 1978).

[230]   *Soule v General Motors Corp*, 882 P 2d 298, 308 (Cal Sup Ct, 1994).

[231]   *Potter v Chicago Pneumatic Tool Co*, 694 A 2d 1319, 1334 (Conn Sup Ct, 1997) ('*Potter*').

[232]   Ibid.

[233]   Owen, 'Design Defects' (n 128) 353. See also Fairgrieve and Goldberg (n 110) 400 [11.40]; Hylton (n 123) 2511.

incorporated into the *Consumer Protection Act 1987* (UK).[234] Adopting a similar framework under the *ACL* would enhance the Australian regime's capacity to respond to modern products, particularly those involving complex AI systems.

In the Australian context, this allocation framework can be further refined to accommodate the growing presence of AI safety standards as discussed above. Specifically, the consumer expectation test element should also be applied to AI safety defects where technical and regulatory standards have been clearly established. In this regard, art 10(2)(b) of the *EU Product Liability Directive* offers a compelling model by creating a rebuttable presumption of defectiveness for products that fail to comply with mandatory safety standards, including 'safety-relevant cybersecurity requirements'.[235] A similar presumption under the *ACL* could streamline liability assessments and ease the evidentiary burden in complex cases involving AI. Conversely, where such standards are absent, incomplete, or contested, the risk-utility test, though not inherently easier, offers a more principled framework to reason through safety trade-offs and feasible design alternatives. Thus, technical and regulatory standards serve a dual function: they help define reasonable consumer expectations and assist courts in allocating cases between the two tests. The more established the standards, the greater the role the consumer expectation test plays in the combined framework. However, since standards are unlikely to fully capture AI's dynamic and evolving nature, the risk-utility test remains essential. Crucially, limiting the risk–utility element to genuinely complex design cases ensures that its use remains targeted to design assessment and avoids the excessive importation of negligence-style balancing into product liability law.

Given that the consumer expectation test is retained as one of the two 'prongs' under the combined approach,[236] the modernisation of this test in the *EU Product Liability Directive* offers significant insights for Australia. Most notably, the Directive incorporates an expanded list of circumstances that courts can consider when assessing defectiveness,[237] and this would allow for a more 'comprehensive' and 'objective' standard for evaluating defectiveness, including the safety of AI systems.[238] Importantly, the inclusion of 'the effect on the product of any ability to continue to learn or acquire new features after it is placed on the market or put into service' is critical in the context of AI technology.[239] This consideration is aligned with the evolving nature of AI products. Moreover, art 7(2)(e) of the Directive stipulates that where the manufacturer retains control over the product after placing it on the market or putting it into service, the time point for assessing defectiveness is 'the moment in time when the product left the control of the manufacturer'.[240] This modification is suited for the digital age, as the traditional assumption (that

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[234] Alessandro Stoppa, 'The Concept of Defectiveness in the *Consumer Protection Act 1987*: A Critical Analysis' (1992) 12(2) *Legal Studies* 210, 217; Fairgrieve and Goldberg (n 110) 394–5 [11.32]–[11.33].

[235] *EU Product Liability Directive* (n 63) recital 32.

[236] Owen, 'Design Defects' (n 128) 341–6.

[237] *EU Product Liability Directive* (n 63) arts 7(2)(a)–(i).

[238] Buiten (n 40) 266; De Bruyne and Dheu (n 27) 41; Wagner, 'Liability Rules' (n 50) 205.

[239] *EU Product Liability Directive* (n 63) art 7(2)(c).

[240] Ibid art 7(2)(e). This shift, however, applies to the features of the last updates or upgrade itself, not the whole product: *EU Product Liability Directive* (n 63) art 11(2)(b). See also Wagner, 'Liability Rules' (n 50) 206.

products exit the manufacturer's sphere of control once circulated) no longer holds true.[241] Technological advancements allow manufacturers to maintain influence over products post-sale through digital means, such as software updates and wireless connections, enabling modifications that can impact product safety even after initial marketing.[242] Article 7(2)(e), thus, effectively aligns the defectiveness criteria with this new reality, ensuring that liability reflects the extended manufacturer oversight of modern technology. Accordingly, the current position under s 9(2)(f) of the *ACL* — that defectiveness is assessed at the time of supply — requires reconsideration.

However, the *EU Product Liability Directive* has notable limitations. The criterion of legitimate expectations remains vague.[243] For instance, acknowledging an AI product's learning capabilities may expand product liability by requiring safety designs for adaptive learning or by undesirably and impractically shifting responsibility to consumers to understand associated risks.[244] The Directive lacks clear guidance on this issue. Moreover, while the Directive now requires consideration of the 'specific needs of the group of users for whose use the product is intended',[245] it remains unclear how courts should weigh these specific needs against the broader objective expectations of the average consumer. Furthermore, the Directive does not clarify whether a risk-utility analysis is permissible, a missed opportunity for clearer standards.[246]

Australia should draw valuable lessons from the *EU Product Liability Directive*, but go beyond its scope to create a more robust framework. While the expanded criteria for assessing consumer expectations should be adapted to modernise and strengthen the consumer expectation test in the digital era, Australia should also adopt a dual approach that combines the consumer expectation and risk-utility tests. This combined approach can offset the limitations of each test, while leveraging their respective strengths. Such a framework would offer a more comprehensive, rational, and objective standard for evaluating product defectiveness, which is particularly essential in an era increasingly shaped by AI technologies.

D   *The Application of the State-of-the-Art Defence to AI Systems' Safety Defects*

A well-defined standard for defectiveness is crucial but insufficient to balance consumer protection with innovation. Equally critical is the careful calibration of defences, particularly the so-called 'state-of-the-art' defence under s 142(c) of the *ACL*. In *Gill*, the Federal Court clarified that the defence is a 'very narrow one'.[247] It is not enough for the manufacturer to claim ignorance; the defect must be one that could not have been discovered by anyone given the objective state of knowledge at

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[241]   Wagner, 'Product Liability' (n 81) 188.

[242]   Ibid.

[243]   De Bruyne and Dheu (n 27) 41.

[244]   Buiten (n 40) 266.

[245]   *EU Product Liability Directive* (n 63) art 7(2)(h), recital 30.

[246]   Veldt (n 124) 26.

[247]   *Gill* (n 152) [3504].

the time of supply.[248] Moreover, drawing on an Explanatory Memorandum[249] and *Merck*,[250] the Court affirmed that manufacturers must actively keep pace with emerging scientific knowledge even after a product is first circulated, ensuring new insights inform subsequent production.[251] Accordingly, the Court observed that the respondents failed to prove that the relevant knowledge regarding the mesh's dangers 'could not have been acquired at an earlier point in time'.[252]

In light of this narrow interpretation, it is unlikely that the state-of-the-art defence would be accepted by courts where AI systems present risks that might have been revealed or fixed by reasonable testing, proper training, earlier scrutiny, or necessary update. This is, however, easier to state doctrinally than to apply in practice, as AI enabled by machine learning capabilities is inherently complex, opaque, rapidly evolving and adaptable to real-world conditions.[253] Defects may also be 'latent' when a product is put into circulation or under the manufacturer's control.[254] Unless clear technical standards and regulatory benchmarks exist to guide foreseeability, it may be difficult for courts to apply the defence rigorously.[255] There is also a risk that manufacturers may exploit this uncertainty to evade responsibility for preventable harms.

The *EU Product Liability Directive* offers useful guidance. Article 11(1)(e) of the Directive extends the relevant liability time period to the entire duration of the manufacturer's control, which Australia should adopt to align with, as discussed above in Part III(C)(3), the modern reality where manufacturers maintain influence over products post-sale through digital means. Importantly, Member States are allowed to derogate from the art 11(1)(e) exemption, enabling stricter liability for specific product categories, where justified by public interest.[256] Australia could take a similar path by empowering sectoral regulators — such as in healthcare or autonomous transport — to develop binding safety benchmarks. As discussed above in Parts III(C)(2)–(3), such standards would help define reasonable expectations and prevent misuse of the state-of-the-art defence. Instead of excluding the defence entirely, as some EU scholars suggest,[257] this calibrated approach would offer better protection for consumers, while avoiding undue constraints on innovation in complex, data-driven technologies.

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248   Ibid.
249   Explanatory Memorandum, Trade Practices Amendment Bill (No 2) 1991 (Cth) 14–15 [43]–[44].
250   *Merck* (n 151) 201 [204].
251   *Gill* (n 152) [3504].
252   Ibid [3506].
253   De Bruyne, Dheu and Ducuing (n 70) 15.
254   Ibid.
255   Mabel Tsui, 'The State of the Art Defence: Defining the Australian Experience in the Context of Pharmaceuticals' (2013) 13(1) *QUT Law Review* 132, 156.
256   *EU Product Liability Directive* (n 63) recital 58, art 18.
257   De Bruyne, Dheu and Ducuing (n 70) 15.

E   *The Scope of Actionable Harm*

The scope of actionable damage under the *ACL* product liability regime is primarily structured around physical harm or damage to physical property such as death, personal injury, and damage to property. This framework remains effective where AI systems, especially embodied AI devices, cause physical injury or damage, such as when an autonomous vehicle malfunctions and causes an accident, a poorly designed robotic arm injures a factory worker, or when AI-enabled medical software leads to personal injury. In these situations, the current product liability law remains largely undisrupted by technological advancements.[258] However, challenges arise in applying the *ACL* to AI systems since they may cause non-physical, psychological harms such as data loss, emotional distress, or pure economic loss. While these harms are not unique to AI or digital technologies, they are prevalent in this context and are not expressly addressed by the *ACL*'s product liability provisions.[259]

For example, an AI-powered home assistant malfunctions due to the flaws in the design of the software and deletes the user's personal data — photos, documents, or health records. While the device itself may be recoverable, the loss of digital data is not compensable under the current *ACL* product liability regime. This is because data is not recognised as 'property' under Australian law and thus does not qualify as 'damage' to 'other goods' within the meaning of s 140(1)(c) of the *ACL*. In *Breen v Williams*, the High Court concluded that medical records were not the patient's property.[260] This position was affirmed in *Farah Constructions Pty Ltd v Say-Dee Pty Ltd*, where the Court held that confidential information did not attract proprietary protection in equity.[261] However, it is worth noting that some digital assets, notably cryptocurrency, have been recognised as property. In *Re Blockchain Tech Pty Ltd*, the Supreme Court of Victoria held that Bitcoin met the four *Ainsworth* criteria for proprietary status (identifiable subject matter, identifiable by third parties, permanence, and transferability)[262] and was properly characterised as 'a chose in action'.[263] Similarly, in *Australian Securities and Investments Commission v NGS Crypto Pty Ltd (No 3)*, the Federal Court treated crypto-assets as 'property' for the purpose of asset preservation orders under s 1323 of the *Corporations Act 2001* (Cth).[264] While these developments confirm that Australian courts are prepared to afford legal protection to digital assets that resemble conventional proprietary interests, user-generated data does not share these features. Unlike cryptocurrencies, personal or operational data lacks independent market value, permanence, and enforceability. As such, it does not meet the *Ainsworth* criteria and remains doctrinally excluded from property law remedies.

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[258] Jonathan Morgan, 'Torts and Technology' in Roger Brownsword, Eloise Scotford, and Karen Yeung (eds), *The Oxford Handbook of Law, Regulation and Technology* (Oxford University Press, 2017) 522, 524. See also, Palmerini (n 113) 88–9.

[259] Morgan, 'Torts and Technology' (n 258) 528; Palmerini (n 113).

[260] *Breen v Williams* (1996) 186 CLR 71, 81–2, 89–90.

[261] *Farah Constructions Pty Ltd v Say-Dee Pty Ltd* (2007) 230 CLR 89, 143–4.

[262] *National Provincial Bank v Ainsworth* [1965] AC 1175, 1248 (Lord Wilberforce).

[263] *Re Blockchain Tech Pty Ltd; Chen v Zhao* (2024) 76 VR 578, 602 [389], see also at 601–2 [382]–[388] ('*Re Blockchain*').

[264] *Australian Securities and Investments Commission v NGS Crypto Pty Ltd (No 3)* [2024] FCA 822, [51] ('*ASIC v NGS*').

Other legal avenues fail to provide adequate redress. Consumer guarantees under ss 51–9 of the *ACL* allow for compensation relating to the supply of goods where consequential loss is a reasonably foreseeable consequence of a failure to comply with those guarantees. [265] However, since data is neither a 'good' nor typically foreseen as part of the transaction unless explicitly discussed, courts are likely to be reluctant to extend guarantees to cover the destruction of personal data. Copyright protects only original compilations of data, not factual content. [266] Confidentiality in equity is also limited, requiring secrecy, commercial value, and protective measures, which are typically absent in ordinary consumer data. [267] Remedies in negligence for data loss as pure economic loss are also challenging due to the high threshold required to establish a duty of care, including the plaintiff's vulnerability to the defendant's conduct, [268] assumption of responsibility, [269] and narrowly construed 'salient features'. [270] Contractual remedies depend on the inclusion of specific terms providing for compensation in the event of data loss, a protection that is rarely found in standard consumer contracts. Privacy law also offers only limited relief. Compensation under the *Privacy Act 1988* (Cth) is limited to the loss or misuse of personal information.[271] Remedies under the new statutory tort of serious invasion of privacy are further restricted to intentional or reckless interferences with personal information and do not extend to unintentional data loss or the loss of general user data caused by product defects.[272] Thus, there remain significant remedial gaps for the destruction of data, a harm increasingly common in digital product ecosystems.

AI systems may also cause psychological harm, particularly when deployed in sensitive domains like healthcare, mental health, or automated decision-making. For example, a consumer using an AI-powered mental health chatbot might suffer acute distress after receiving inappropriate or harmful advice due to flawed analysis. [273] Since AI software may be classified as 'goods',[274] when incorporated into a service (such as a chatbot), product liability law may apply to the AI software, as confirmed by EU case law. [275] Moreover, AI systems can also cause pure

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[265]   *ACL* (n 8) s 259(4).

[266]   *Copyright Act 1968* (Cth) ss 10(1), 32(1); *Desktop Marketing Systems Pty Ltd v Telstra Corp Ltd* (2002) 119 FCR 491, 592–3 [408]–[409].

[267]   *Smith Kline & French Laboratories (Aust) Ltd v Secretary, Department of Community Services and Health* (Cth) (1990) 22 FCR 73, 121.

[268]   *Perre v Apand Pty Ltd* (1999) 198 CLR 180, 225.

[269]   *Mallonland Pty Ltd v Advanta Seeds Pty Ltd* (2024) 418 ALR 639, 648 ('*Mallonland*').

[270]   Ibid 654, 670–1.

[271]   *Privacy Act 1988* (Cth) ss 36(1), 52(1)(b)(iii). Unlike art 82 of the *EU General Data Protection Regulation*, the Australian regime requires OAIC involvement before compensation is available. Importantly, art 82 of the EU Regulation expressly recognises non-material harm, arguably including data loss: see *Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the Protection of Natural Persons with regard to the Processing of Personal Data and on the Free Movement of Such Data, and Repealing Directive 95/46/EC* [2016] OJ L 119/1, art 82 ('*EU General Data Protection Regulation*').

[272]   *Privacy Act 1988* (Cth) (n 271) sch 2.

[273]   In this article I focus on psychological harm caused by AI design defects, not harms arising from the inherent functionality of a technology like gaming addiction unless linked to specific design features such as lack of safety controls.

[274]   See Part III(A).

[275]   See above n 87.

economic loss, 'independent of damage to property or people'.[276] For instance, an AI-driven expert system can malfunction and provide misleading recommendations prompting consumers to purchase overpriced products. While this type of financial harm may be actionable in negligence or contract, depending on the presence of a duty of care or express terms, it is not consequent on any physical injury or property damage and therefore falls outside the scope of s 138 of the *ACL*.[277]

As a result of these gaps in damages actionability, there is growing support for expanding product liability law to address harms prevalent in the digital age, ensuring accountability and avoiding scenarios where technology causes harm without appropriate compensation.[278] However, as Morgan has warned, not every harm should be 'actionable', and there is a 'danger of unthinkingly expanding categories'.[279] This concern echoes longstanding tort law doctrine that warns against creating the conditions for indeterminate liability — where liability arises without clearly defined limits or thresholds.[280] Accordingly, instead of expanding the scope of actionable damage to encompass all harms possibly caused by technologies, it might be more appropriate to carefully broaden the concepts of physical injury and property damage to cover also harm whose 'manifestation […] can be ascertained objectively'[281] such as damage to data and psychological harms that amount to 'recognised state of illness'.[282] There are strong grounds for these adjustments. As outlined above, despite data's critical role in the digital economy, the Australian legal system currently offers no clear remedy for data destruction or corruption. Although some digital assets, such as cryptocurrencies, have recently been recognised as a form of property by Australian courts,[283] this recognition has not extended to personal or consumer data. Therefore, a legislative response is necessary to place harms to personal data on equal footing with traditional property damage.[284] Since the destruction of data can lead to substantial harm, potentially surpassing the impact of damage to traditional tangible property,[285] such reform would be 'a welcome acknowledgment of the changing landscape of property in the digital era'.[286]

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[276] Kelly Godfrey, 'An Analysis of Pure Economic Loss' (2001) (76) *Australian Construction Law Newsletter* 21, 21.

[277] Christiane Wendehorst, 'Strict Liability for AI and Other Emerging Technologies' (2020) 11(2) *Journal of European Tort Law* 150, 162.

[278] See, eg, Wright, Lindsay and Wilkinson (n 129) 25.

[279] Morgan, 'Torts and Technology' (n 258) 528

[280] Godfrey (n 276) 22.

[281] Wendehorst, 'Strict Liability for AI and Other Emerging Technologies' (n 277) 166.

[282] Ibid.

[283] See eg, *Re Blockchain* (n 263); *ASIC v NGS* (n 264). English courts have a similar position: see, eg, Law Commission (UK), *Digital Assets: Consultation Paper* (Law Com No 256, 28 July 2022) 45 [3.48]; *AA v Persons Unknown* [2020] 4 WLR 35, 11 [61]; *Osbourne v Persons Unknown Category A* [2023] EWHC 340 (KB), [23].

[284] Wagner, 'Product Liability' (n 81) 186–7.

[285] Ibid.

[286] Wagner, 'Liability Rules' (n 50) 211, see also at 210.

Calculation of data-related damages remains complex and doctrinally underdeveloped. However, courts in jurisdictions such as the US and United Kingdom ('UK') have begun grappling with this issue,[287] and these developments may provide useful reference points for Australian courts. Similarly, it is also desirable to cover psychological harms that amount to a recognised psychiatric illness. Although some have suggested the inclusion of psychological harm in its widest sense,[288] such an expansive recognition would create inconsistencies with well-established Australian law that has both judicially and statutorily required 'recognisable psychiatric illness' as a prerequisite for recovery.[289] Arguably, psychological harm that meets World Health Organization criteria already constitutes a physical injury under Australian product liability law.[290] Nevertheless, given the rise in psychological harms linked to AI systems, the legal framework should explicitly incorporate psychological harms that amount to a recognised illness as an actionable damage to ensure legal certainty and clarity.[291]

The expansion of the scope of compensable damage under the ACL to pure economic loss (financial harm not arising from physical injury or property damage), however, appears premature due to established judicial reluctance. Courts in Australia,[292] the UK,[293] and the EU,[294] are traditionally reluctant to grant a compensation for a pure economic loss, primarily to avoid a 'potentially excessive scope of liability for financial loss'.[295] The High Court of Australia recently reconfirmed that, in general, individuals do not have a duty of care to prevent another party from suffering reasonably foreseeable pure economic loss.[296] The Court reinforced established common law principles, stating that recovery for pure economic loss is strictly confined to situations where the parties' relationship involves an assumption of responsibility or other 'salient features' giving rise to a duty of care.[297] Given that the assumption of responsibility may be negated and the

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[287] See, eg, *In re Facebook, Inc, Consumer Privacy User Profile Litigation*, 402 F Supp 3d 767, 783–7 (ND Cal, 2019) (rejecting speculative damage theories, such as risk of identity theft and economic loss, as insufficient for standing, but accepting intangible privacy injuries as cognisable); *Lloyd v Google LLC* [2022] AC 1217, 1263 (rejecting compensation for 'loss of control' of personal data without material damage or distress).

[288] Koch (n 68) 115. The Supreme Court of Canada removed the requirement of a recognisable psychiatric illness: *Saadati v Moorhead* [2017] 1 SCR 543, 550 [2].

[289] See, eg, *Tame v New South Wales* (2002) 211 CLR 317, 329 [7]; *Wrongs Act 1958* (Vic) ss 72, 75; *Civil Law (Wrongs) Act 2002* (ACT) s 34; *Civil Liability Act 2002* (NSW) s 32. See also Ian Freckelton and Tina Popa, 'Recognisable Psychiatric Injury' and Tortious Compensability for Pure Mental Harm Claims in Negligence' (2018) 25(5) *Psychiatry, Psychology and Law* 641, 647–9.

[290] Christiane Wendehorst, European Commission, *Safety and Liability Related Aspects of Software* (Report, 17 June 2021) 81; *EU Product Liability Directive* (n 63) recital 21. See also World Health Organization, *International Statistical Classification of Diseases and Related Health Problems* (11th rev, in effect from 1 January 2022).

[291] Wendehorst, *Safety and Liability Related Aspects of Software* (n 290) 81; *EU Product Liability Directive* (n 63) recital 21.

[292] *Mallonland* (n 269).

[293] Morgan, 'Torts and Technology' (n 258) 528; *Armstead v Royal & Sun Alliance Insurance Co Ltd* [2025] AC 406, 418–20.

[294] Wagner, 'Liability Rules' (n 50) 219.

[295] *Mallonland* (n 269) 647 (Gageler CJ, Gordon, Steward, Gleeson, Jagot and Beech-Jones JJ).

[296] Ibid 647–50.

[297] Ibid.

'salient features' are construed 'as narrowly as possible',[298] recovering for pure economic loss in negligence is particularly challenging in Australia. Although negligence and product liability are distinct causes of action, the stringent criteria applied in negligence law suggest that expecting a more generous approach to pure economic loss under the *ACL*'s product liability regime would be unrealistic. Consequently, even if extending the scope to include limited types of pure economic loss may be desirable, it would face significant doctrinal hurdles under the current Australian legal and judicial landscape.

In light of the above analysis, the *EU Product Liability Directive* appears correct in selectively expanding the scope of actionable damage. Article 6(1)(c) of the Directive expressly includes the 'destruction or corruption of data' equating data with tangible property. This is an 'important move',[299] or a 'step in the right direction',[300] to recognise 'the growing importance of data' in the digital era.[301] Similarly, the inclusion of psychological harm within 'personal injury' under art 6(1)(a), limited to 'medically recognised damage',[302] represents a justified modernisation of the personal injury concept. It acknowledges prevalent digital harms, while maintaining a principled evidentiary threshold.[303] Leaving pure economic loss outside the scope of actionable damage is also a practical decision, reflecting the broader judicial tendency to avoid the potential for indeterminate liability.[304]

However, despite these improvements, the exclusion of data 'used for professional purposes' remains contested.[305] Wagner argues that this 'discriminates'[306] against professional users and undermines the goal of fair compensation for all parties harmed by defective products.[307] While this criticism has merit, especially in a digital economy where professional tools and data often overlap with consumer technologies, a cautious approach remains appropriate for Australia. Commercial actors typically have access to alternative remedies under contract and negligence law, or can rely on commercial insurance to allocate risk. Moreover, expanding strict liability to cover commercially used data could invite speculative or excessive claims.[308] Thus, the *EU Product Liability Directive*'s continued exclusion of professional data loss is justified and reflects a deliberate policy choice to balance innovation, risk, and accountability. Nonetheless, as

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[298] Ibid 648, 654.

[299] Wagner, 'Product Liability' (n 81) 186, see also at 187.

[300] Wagner, 'Liability Rules' (n 50) 209.

[301] Ibid 211, see also at 210.

[302] *EU Product Liability Directive* (n 63) art 6(1)(a), recital 21.

[303] Ibid recital 21.

[304] Ibid arts 6(1)–(2); recital 24 (stating that types of damage such as 'pure economic loss, privacy infringements or discrimination' should not by themselves trigger liability under the Directive).

[305] Ibid recital 22, art 6(1)(c).

[306] Wagner, 'Product Liability' (n 81) 181.

[307] Ibid 180–1, 187; Wagner, 'Liability Rules' (n 50) 209, 211. See also Koch (n 68) 115 (criticising the failure of the revised EU regime to extend protection to data used for professional purposes, noting that while tangible items used for both private and professional purposes are protected, digital files are excluded if they have any professional application).

[308] *EU Product Liability Directive* (n 63) recital 22.

product liability law evolves beyond its consumer-protection origins, [309] future reforms in Australia may consider whether targeted extensions, under either the *ACL* or sectoral regulations, are necessary, particularly for commercially critical data in sectors such as healthcare, finance, energy, and logistics.

IV   Conclusion

The rapid proliferation of AI systems across industries has heightened concerns over their potential to cause harm to individuals, property, and other legally protected interests. The underlying principle of product liability law that liability should fall on the cheapest cost avoider remains relevant for preventing harm caused by AI systems, as it minimises societal costs and incentivises AI developers to adopt higher safety standards, rigorous testing, and continuous monitoring. Although the defective goods provisions under the *ACL* are generally applicable to address defects in AI systems, reforms are essential to ensure that the *ACL* remains relevant and effective in addressing defective goods in the age of AI-driven technologies. These include: clarifying the term 'component' of goods to encompass digital elements such as AI-related services; recognising parties modifying AI systems post-release as manufacturers; and refining the test for assessing defectiveness to better capture the complexities of AI technologies. Moreover, to align with modern realities and avoid overly broad categories of harm, the scope of actionable damage should be carefully expanded to cover data loss and recognised psychiatric illnesses. Drawing on best practices from the EU and the US, these reforms are critical for Australia to establish a robust legal framework that protects consumers, incentivises safer AI design, and ensures fairness in liability allocation.

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[309] *María Victoria González Sánchez v Medicina Asturiana SA* (C-183/00) [2002] ECR I-3905, I-3914 [26]–[27]; Wagner, 'Liability Rules' (n 50) 209.