วารสารนิติศาสตร์
มหาวิทยาลัยธรรมศาสตร์
THAMMASAT LAW JOURNAL

ชื่อเรื่อง: Enterprise Liability in Product Liability in the Era of AI: The Study of the New Product Liability Directive of the European Union

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การอ้างอิงที่แนะนำ: Laddawan Yaimanee, 'Enterprise Liability in Product Liability in the Era of AI: The Study of the New Product Liability Directive of the European Union' (2569) 55(3) วารสารนิติศาสตร์ มหาวิทยาลัยธรรมศาสตร์ 1042.

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Enterprise Liability in Product Liability in the Era of AI: The Study of the New Product Liability Directive of the European Union
ความรับผิดในฐานะผู้ประกอบการในกฎหมายความรับผิดของผลิตภัณฑ์ในยุคของปัญญาประดิษฐ์ : ศึกษาข้อบังคับความรับผิดของผลิตภัณฑ์รูปแบบใหม่ของสหภาพยุโรป*

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Abstract

Artificial intelligence (AI) represents a novel innovation on a global scale, providing significant convenience across various aspects of human life. However, the unique characteristics of AI—its complexity, opacity, and autonomy from human control—fundamentally distinguish it from traditional products. These distinct features inevitably lead to new and complex legal challenges regarding liability, diverging significantly from the conventional frameworks established under existing legal systems. Consequently, it is essential to reconsider and reform the legal framework governing liability for defective products and services in light of these technological advancements.

* This paper is part of the research “AI Liability Under Enterprise Liability in Thailand: A Comparative Study.” The sponsorship is by the Court of Justice, Thailand.

This article focuses on analysing the theory of enterprise liability in relation to defective products, particularly those involving AI. It examines how enterprise liability might be applied to AI-related harms. The legal framework of the European Union Directive 2024/2853 on product liability serves as the primary case study, investigating the extent to which the EU Directive aligns with the principles of enterprise liability and how theoretical foundations have been utilised to inform recent reforms.

The analysis also examines the EU's recent reforms aimed at addressing AI-specific challenges, including the redefinition of the term "economic operator," the expansion of the definition of "product" to encompass both tangible and intangible items, and the extension of liability rules to certain services. Furthermore, the article considers presumptions regarding the burden of proof and product defectiveness, which are intended to alleviate evidential difficulties for claimants. These reforms are assessed in terms of both their strengths and limitations.

Subsequently, the article considers whether Thailand should adopt elements of the EU's approach to revise its Liability for Damages Arising from Unsafe Products Act B.E. 2551 (2008). The findings suggest that Thailand's legal framework on liability for defective products should be expanded in several key areas. For example, the definition of "economic operator" should be broadened to include businesses involved in the development and provision of AI, the definition of "product" should be extended to cover both movable and immovable items, whether tangible or intangible, and the scope of the law should be broadened to encompass services alongside products. Additionally, Thai law should introduce legal presumptions regarding product defectiveness and shift the burden of proof to the operator in cases involving AI-related products and services. The definition of "damage" should also be expanded to cover non-material harms, such as loss or destruction of data.

Crucially, the Thai legal system must also consider including a "development risks defence" for manufacturers, which would provide an exemption from liability where, at the time of placing the product or service on the market, the risks could not reasonably have been known based on the existing scientific or technical knowledge.

These recommendations aim to align Thai law with the principles of enterprise liability and strike a fair balance between the interests of producers and consumers in the era of artificial intelligence.

Keywords: AI, Artificial Intelligence, enterprise liability, product liability, European Union, AI liability

บทคัดย่อ

ปัญญาประดิษฐ์ถือเป็นนวัตกรรมใหม่ในสังคมโลก ทั้งช่วยอำนวยความสะดวกให้แก่มนุษย์ในหลากหลายด้าน โดยลักษณะคุณสมบัติของปัญญาประดิษฐ์ที่มีความซับซ้อน คาดเดายาก และเป็นอิสระจากการควบคุมของมนุษย์ ทำให้ปัญญาประดิษฐ์แตกต่างจากสินค้าในอดีต คุณสมบัติที่แตกต่างนี้ย่อมทำให้ความรับผิดของปัญญาประดิษฐ์มีความซับซ้อนและแตกต่างจากที่กฎหมายในบริบทดั้งเดิมเคยดำเนินการ ทำให้ต้องมีการศึกษาและแก้กฎหมายเกี่ยวกับความรับผิดของสินค้าและบริการเสียใหม่

บทความนี้เน้นที่การวิเคราะห์ทฤษฎีความรับผิดขององค์กรในผลิตภัณฑ์ที่ชำรุดบกพร่อง โดยเฉพาะผลิตภัณฑ์สินค้าและบริการที่เกี่ยวข้องกับปัญญาประดิษฐ์ โดยวิเคราะห์ว่าจะสามารถนำทฤษฎีดังกล่าวมาใช้กับความรับผิดของปัญญาประดิษฐ์ได้อย่างไรบ้าง ทั้งนี้โดยมีข้อบังคับของสหภาพยุโรปว่าด้วยความรับผิดของผลิตภัณฑ์ 2024/2853 เป็นกรณีศึกษา โดยจะวิเคราะห์ความเหมาะสมของข้อบังคับของสหภาพยุโรปกับทฤษฎีความรับผิดขององค์กรว่ามีความเกี่ยวพันกันอย่างไร และทางสหภาพยุโรปนำหลักการทางทฤษฎีมาใช้ปรับปรุงแก้ไขข้อบังคับอย่างไร จากนั้นจึงศึกษาหัวข้อที่สำคัญที่ทางสหภาพยุโรปแก้ไขปรับปรุงให้เหมาะสมกับความผิดของปัญญาประดิษฐ์ อาทิการสร้างนิยามใหม่ของผู้ประกอบการ การขยายคำจำกัดความของผลิตภัณฑ์และขยายขอบเขตอำนาจของกฎหมายให้ครอบคลุมถึงบริการ การเพิ่มข้อสันนิษฐานของภาระการพิสูจน์ ข้อสันนิษฐานของความชำรุดบกพร่องของสินค้า เป็นต้น ทั้งนี้ในบทความจะวิเคราะห์จุดอ่อนและจุดแข็งของกฎหมายดังกล่าว จากนั้นจึงวิเคราะห์ว่าประเทศไทยควรยึมหลักการจากสหภาพยุโรปเพื่อมาปรับปรุงแก้ไขพระราชบัญญัติความรับผิดต่อความเสียหายที่เกิดจากสินค้าที่ไม่ปลอดภัย พ.ศ. 2551 หรือไม่อย่างไร

ซึ่งผลจากการวิเคราะห์พบว่า กฎหมายว่าด้วยความรับผิดต่อผลิตภัณฑ์ที่ชำรุดบกพร่องของประเทศไทยควรขยายกรอบคำจำกัดความของคำว่าผู้ประกอบการให้ครอบคลุมถึงผู้ประกอบธุรกิจเกี่ยวกับปัญญาประดิษฐ์ ควรขยายคำจำกัดความของสินค้าให้ครอบคลุมถึงสินค้าที่มีรูปร่างและไม่มีรูปร่าง เคลื่อนที่ได้และเคลื่อนที่ไม่ได้ รวมถึงขยายกรอบขอบเขตของกฎหมายให้รวมถึงบริการ นอกจากนั้น กฎหมายไทยควรมีข้อสันนิษฐานความบกพร่องของสินค้าและข้อสันนิษฐานการผลักภาระการพิสูจน์ให้กับผู้ประกอบการในสินค้าและบริการที่เกี่ยวข้องกับปัญญาประดิษฐ์ รวมถึงขยายนิยามความเสียหายให้ครอบคลุมถึงความเสียหายจากการสูญเสียข้อมูลหรือข้อมูลถูกทำลาย ทั้งนี้ที่สำคัญที่สุดประเทศไทยควรคำนึงถึงการยกเว้นความรับผิดของผู้ประกอบการในกรณีที่ ณ เวลาที่ปล่อยสินค้าและบริการออกสู่ตลาดยังไม่มีหลักฐานข้อมูลทางวิทยาศาสตร์หรือการค้นพบใดที่แสดงว่าสินค้าหรือบริการนั้นเป็นอันตรายต่อผู้บริโภค ทั้งหมดนี้เป็นสิ่งที่ประเทศไทยควรดำเนินการให้สอดคล้องกับทฤษฎีความรับผิดขององค์กรและสร้างดุลยภาพระหว่างผลประโยชน์ของผู้ผลิตและผู้บริโภค

คำสำคัญ : AI ปัญญาประดิษฐ์ ความรับผิดของผู้ผลิต ความรับผิดของผู้ประกอบการ สหภาพยุโรป ความรับผิดของปัญญาประดิษฐ์

1. The Search for a New Anchor: The Single Point of Litigation

The failure of the fault-based model, driven by AI's complexity, opacity, and autonomy, necessitates a new anchor for liability. A growing body of legal scholarship suggests that, to be effective, any new framework must provide a clear and accessible single point of litigation for victims. This concept, rooted in enterprise liability theory, shifts the focus from the impossible task of blaming a single actor to the practical goal of providing effective redress. The central question then becomes: who should this single-entry point be?

Scholars have proposed various models to answer this question. Some, like Fonseca Sequeira and Xavier, advocate for a broad joint and several liability frameworks, allowing victims to sue any party in the supply chain.[1] Others, such as Gredka-Ligarska, explore vicarious liability based on agency law, holding the principal (owner or operator) responsible.[2] A more systemic approach is the collective fund model, where an entire industry sector contributes to a compensation fund.[3]

While each model aims to simplify the process for victims, they present their own challenges, from potentially targeting financially weaker parties to diffusing responsibility too broadly. However, a consistent and powerful theme emerges from the literature, most notably in the work of Beckers and Teubner[4] Cobbe, Veale and Singh[5] and Bertolini and Episcopo:[6] the manufacturer is the most logical and effective single point of responsibility.

This article endorses and builds upon this conclusion. The manufacturer is the natural focal point for consumer redress because they are the entity that designs the

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[1] Ana Taveira da Fonseca, Elsa Vaz de Sequeira and Luís Barreto Xavier, 'Liability for AI Driven Systems' in Henrique Sousa Antunes and others (eds) *Multidisciplinary Perspectives on Artificial Intelligence and the Law* (Springer International Publishing 2024) 300.

[2] Iwona Gredka-Ligarska, 'Employer as an AI System Operator and Tortious Liability for Damage Caused by AI Systems: European and US Perspectives' (2024) 12 The Chinese Journal of Comparative Law 1, 14.

[3] Anna Beckers and Gunther Teubner, *Three liability regimes for artificial intelligence: Algorithmic actants, hybrids, crowds* (Hart Publishing 2022) 125.

[4] Ibid 102.

[5] Jennifer Cobbe, 'Michael Veale and Jatinder Singh, 'Understanding accountability in algorithmic supply chains' (12 June 2023) Proceedings of the 2023 ACM Conference on Fairness, Accountability, and Transparency 1186 <https://dl.acm.org/doi/epdf/10.1145/3593013.3594073> accessed 30 April 2025.

[6] Andrea Bertolini and Francesca Episcopo, 'The Expert Group's Report on Liability for Artificial Intelligence and Other Emerging Digital Technologies: a critical assessment' (2021) 12 European Journal of Risk Regulation 644, 656.

product, profits from its sale, possesses superior technical knowledge, and is best positioned to implement safety measures and secure insurance. Focusing on the manufacturer is not about absolving other actors, but about providing the most direct and workable path to justice for the consumer. It is this manufacturer-consumer relationship, anchored by the principle of a single point of litigation, that forms the core of the liability framework developed in this work.

2. What is artificial intelligence, and how does it impact tort law under fault-based liability?

2.1 Defining AI for Legal Liability

To analyse AI liability, a functional definition of AI is required. While no single consensus definition exists, legal scholarship offers a pragmatic approach. Rather than focusing on abstract notions of consciousness or science-fiction imagery, the key is to define AI based on its capabilities and functions.[7] This work adopts a task-based perspective, viewing AI as a sophisticated tool designed to perform tasks that would otherwise require human cognition.[8] This approach, supported by scholars like Dignum, who frames AI as a system processing information to achieve a goal.[9] It is crucial because it allows the law to regulate AI based on what it does and the risks it creates, regardless of its form.

Scholars offer several convergent definitions that are useful for legal analysis. Calo defines AI as techniques approximating human or animal cognition,[10] while others like Sheikh, Prins and Schrijvers focus on the imitation of complex human skills.[11] A particularly useful definition comes from König, Krafft, Schulz and Zweig, who describe AI as digital artefacts with at least one learning or learned component capable of

[7] Haroon Sheikh, Corien Prins and Erik Schrijvers, 'Artificial Intelligence: Definition and Background' in Haroon Sheikh, Corien Prins and Erik Schrijvers (eds) *Mission AI: The New System Technology* (Springer International Publishing 2023) 16.

[8] Ibid.

[9] Virginia Dignum, *Responsible Artificial Intelligence How to Develop and Use AI in a Responsible Way* (Springer 2019) 3.

[10] Ryan Calo, 'Artificial Intelligence Policy: A Primer and Roadmap' (2017) 404 <http://dx.doi.org/10.2139/ssrn.3015350> accessed 10 August 2025.

[11] Haroon Sheikh, Corien Prins and Erik Schrijvers (n 8) 15-16.

adapting its behaviour based on data.[12] This concept of adaptive learning is a critical distinguishing feature from traditional, static software.

The legal implications of this task-based, adaptive learning definition are profound. It moves the focus away from the question of whether an AI is intelligent and towards the question of whether a product can create unforeseeable risks. A self-driving car navigating traffic and an AI agent independently[13] creating subtasks to achieve a complex objective both fall squarely under this functional definition.

The common legal challenge is the system's capacity to function and evolve independently after deployment. This functional definition provides the necessary foundation for examining the specific characteristics of AI that disrupt traditional tort law, which will be the focus of the following sections.

2.2 The Legally Disruptive Characteristics of AI

The inadequacy of fault-based liability stems directly from AI's fundamental characteristics, which distinguish it from previous technologies. To ground the legal analysis, it is necessary to identify these core traits. While the academic literature presents varied lists of AI's features, such as the comprehensive report by the EU AI High-Level Expert Group, which includes predictability and vulnerability, a clear consensus emerges around three characteristics with the most profound legal implications.[14] Scholars like Buiten, Streel, and Peitz, for instance, explicitly identify complexity, opacity, and autonomy as the core unique traits of AI.[15] This work, therefore, adopts these three characteristics as its analytical focus, examining each not as a technical feature, but as a direct challenge to the pillars of traditional tort law.

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[12] Pascal D. König and others, 'Essence of AI: What Is AI?' in Larry A. DiMatteo, Cristina Poncibò and Michel Cannarsa (eds) *The Cambridge Handbook of Artificial Intelligence: Global Perspectives on Law and Ethics* (Cambridge Law Handbooks, Cambridge University Press 2022) 34.

[13] Anna Gutowska, 'What are AI agents?' (IBM, 27 December 2024) <https://www.ibm.com/think/topics/ai-agents> accessed 11 June 2025.

[14] Andrea Bertolini and Francesca Episcopo, 'The Expert Group's Report on Liability for Artificial Intelligence and Other Emerging Digital Technologies: A Critical Assessment' (2021) 12 European Journal of Risk Regulation <http://dx.doi.org/10.1017/err.2021.30> accessed 24 October 2024.

[15] Miriam Buiten, Alexandre de Streel and Martin Peitz, 'The law and economics of AI liability' (2023) 48 Computer Law & Security Review 105794, 5.

2.2.1 Complexity and the Breakdown of Causation

First, AI systems are defined by their complexity. Unlike a traditional product, an AI system is often an ecosystem of interconnected software, hardware, and data from a variety of stakeholders.[16] A self-driving car, for example, integrates numerous systems and services to function.[17] This multi-actor causation and diffused control make it nearly impossible to trace a single harmful outcome back to a single point of failure or a single wrongdoer. The traditional legal requirement of proving a clear causal link between a defendant's action and a victim's harm is thus rendered largely unworkable.

2.2.2 Opacity and the Impossibility of Proof

Second, AI is characterised by its opacity, often referred to as the 'black box' problem. The decision-making processes of machine learning systems can be incomprehensible even to their creators, making it impossible to know precisely why a specific output occurred.[18] This opacity creates a severe evidential asymmetry. It transforms the claimant's burden of proof from a difficult task into a structurally impossible one.[19] A legal system that requires a consumer to prove a specific fault within a system whose inner workings are unknowable is, by design, inequitable.

2.2.3 Autonomy and the Failure of Foreseeability

Finally, the most disruptive characteristic is autonomy. AI systems can learn and adapt their behaviour after deployment, leading to emergent actions that were not explicitly programmed or foreseen by their manufacturers.[20] This capacity for independent action directly subverts the foundational legal tests of foreseeability and the standard of care. When a manufacturer can plausibly argue they could not have foreseen a specific harmful outcome, the very concept of negligence begins to crumble, creating a potential 'accountability vacuum' where harm occurs, but no one is legally responsible under a traditional fault-based regime.

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[16] Ibid 6.

[17] The Expert Group on Liability and New Technologies (n 15) 33.

[18] Miriam Buiten, Alexandre de Streel and Martin Peitz (n 16) 6.

[19] The Expert Group on Liability and New Technologies (n 15) 3.

[20] Miriam Buiten, Alexandre de Streel and Martin Peitz (n 16) 6.

3. Theoretical Foundations of Enterprise Liability

Enterprise liability, therefore, presents a more appropriate and adaptable framework for the unique challenges of AI. The idea is that manufacturers who benefit from selling AI products or services should be responsible for any defects in these AI products or services. This approach will help to rebalance the asymmetric power between manufacturers and consumers. Enterprise liability will strengthen principles of justice and responsibility allocation. Within an advanced enterprise liability framework, these measures will also aid in balancing litigation challenges such as proof obligations, causality standards, and scope of protection. They will enhance the flexibility and practicality of AI liability applications.

The concept of enterprise liability is not settled among scholars. This concept seems to be the principle of product liability in industrial processes. Scholars have attempted to summarise its meaning through various opinions. For example, Guido Calabresi postulates that enterprise liability serves as a framework for allocating losses to those most likely to insure against such risks.[21] Calabresi suggests that the concept of enterprise liability focuses on determining the appropriate entity to bear the associated costs. However, Keating emphasises the importance of product liability in conjunction with principles of equity. Enterprise liability should aim to restore balance between manufacturers and consumers. Implementing optimal deterrence alongside an equitable distribution of equity promotes justice, thus forming the foundation for enterprise liability.[22]

From these concepts, this article defines enterprise liability, with the basic principle grounded in distributive justice because it focuses on the allocation of risk rather than fault. The legal principle requires manufacturers to be financially responsible for accidents, thereby absolving consumers from the burden of proving fault. The primary aim is to create balance in the interactions between manufacturers and consumers. The central idea underpinning this legal principle concerns protection from possible harm and the distribution of risk.

There are two core ideas of enterprise liability that should be considered when analysing how the law complies with the theory.

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[21] Guido Calabresi, *The Cost of Accidents: A Legal and Economic Analysis* (Yale University Press 1970) 50.

[22] Gregory C. Keating, 'The Idea of Fairness in the Law of Enterprise Liability' (1997) 95 Michigan Law Review 1266, 1270.

3.1 Internalisation

It is important to introduce the concept of risk internalisation in enterprise liability before discussing enterprise liability in subsequent sections. Cost internalisation refers to the principle that an enterprise responsible for causing accident costs should absorb these costs and allocate them efficiently among its beneficiaries.[23] It is crucial to ensure that the victim does not bear the burden of these accident costs.[24] Manufacturers ought to cover the costs associated with accidents. When companies operate and sell products, they benefit from these products, making it essential to accept this risk.

Keating suggests that internalisation can act as a form of self-insurance for manufacturers, as insurance costs are included in product pricing, such as employee wages and the expenses incurred for materials suppliers.[25] This framework relies heavily on the calculation of costs that enterprises include in the price. They calculate the expenses of products or services. For example, consumers pay a fee each month for AI chatbots. The enterprise also assesses its operational costs and the associated risks in the service fee.

3.2 Distribution of Risk

The second key consideration is the allocation of risk, which refers to how the enterprise distributes costs among consumers, employees, suppliers, and shareholders, rather than concentrating solely on the victim or the specific agent accountable for the injury.[26] In fact, it is easier for many people to bear a small amount of money than for any one of them to shoulder the large cost by themselves. This is the concept proposed by Guido Calabresi in his work, emphasising the need to assign losses to those capable of transferring a portion of the loss to the customers of their products. Transferring the losses to buyers serves as a form of self-insurance for the firm because[27] it can be argued that in some explanations there is an overlap with the concept of internalisation, particularly in Calabresi's discussion regarding self-insurance. However, the central

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[23] Gregory C. Keating, 'Enterprise Liability: Collective Responsibility and Commutative Justice' in *Reasonableness and Risk: Right and Responsibility in the Law of Torts* (Oxford University Press 2022) 272.

[24] Ibid.

[25] Ibid.

[26] Ibid.

[27] Guido Calabresi (n 22) 51.

argument of his perspective suggests that within society, it is unavoidable to assign accident costs to an individual, and manufacturers emerge as the most suitable entity to allocate those losses to others.

The author endorses Calabresi's proposal and argues that manufacturers should bear the costs, as they are entrepreneurs capable of spreading the losses across their products and services. This paper will illustrate how a contemporary AI technology company can share product risk among various stakeholders.

This example demonstrates the technique employed by OpenAI in distributing costs among its partners and consumers. Microsoft functions as a corporate partner that invests in OpenAI's research and, in exchange, obtains exclusive rights to integrate OpenAI's technology, notably ChatGPT, into its offerings.[28] It is important to note that Microsoft's applications, such as Microsoft 365 Copilot and GitHub Copilot, leverage the services provided by OpenAI. Furthermore, OpenAI and Microsoft offer AI software services to a worldwide consumer base. This collaboration facilitates the sharing of operational expenditures, encompassing costs associated with servers and computational resources, investments in research directed towards model enhancement, and licensing fees for databases. The allocation of these costs may be divided among OpenAI, Microsoft, and other affiliated entities. Furthermore, in instances where consumers opt to enhance their service and incur a fee, it is possible that OpenAI will directly collect this charge from the enterprise.

To conclude, internalisation and risk distribution serve as elements to demonstrate the adequacy of law in achieving its initial objectives of enterprise liability regarding product liability. In fact, numerous statutory laws in each jurisdiction can be applied to the relationship between manufacturers and consumers. Discussing all of them might be rather complicated and challenging. This article focuses on the new product liability law of the European Union.

4. The New European Product Liability Directive 2024/2853

The question of liability for AI becomes clearer when determining who will be the single point of litigation when harm occurs. In Thailand, there is no clear conclusion. The State still applies the Liability for Damages Arising from Unsafe Products Act B.E. 2551 (2008) or the Unsafe Products Act as a safe place for consumers, without considering

[28] OpenAI, 'Our structure' (OpenAI, 2025) <https://openai.com/our-structure/> accessed 10 May 2025.

that the Act is not appropriate for AI. For example, the Act does not cover AI services for claims, and its narrow scope of AI actors focuses only on entrepreneurs. This is why it is important to study the new European Product Liability Directive, an innovative legal tool for AI liability that applies the enterprise liability concept.

The 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, also known as the new PLD, represents a legal innovation that was recently promulgated and took effect on 9 December 2024,[29] modifying the EU-wide framework for consumer claims for compensation resulting from product-related injury. This new product liability framework will be applied in the member states by December 2026. It confirms that this new PLD remains under the strict liability regime; however, this new PLD is designed to reflect the new liability regime of AI. There are various principles that differ from the European Council Directive 85/374/EEC, such as the presumption of causality. It can be observed that this new PLD exhibits a stronger influence of enterprise liability than its predecessor. For this reason, the new PLD should be studied and discussed in detail in comparison to the traditional product liability framework in Thailand.

According to the new PLD, it pertains to a product of the new digital age. As society transitions from an industrial society to an AI era, the nature of products differs from that of the past. The preamble of the new PLD indicates that it serves specific purposes. First, it aims to establish liability rules that reflect the nature and risks of products and services in the digital age and circular economy, ensuring a fair balance between the legitimate interests of manufacturers, injured persons, and consumers general.[30] This framework of enterprise liability fundamentally relies on the provisions outlined in each article of the new PLD.

The new PLD represents a pioneering effort in product liability legislation, addressing the complexities of liability within the context of the digital age. This underscores the necessity of examining this Directive in conjunction with its predecessor to understand the progression of product liability law and enterprise liability. This is particularly pertinent given that this Directive pertains directly to AI products and services, which are the focal point of this article.

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[29] Directive (EU) 85/374/EEC of the European Parliament and of the Council of 23 October 2024 on liability for defective products and repealing Council Directive [2024] OJ L/2024/2853/1.

[30] ibid.

5. Enterprise Liability in AI Product Liability: A Comparative Study of the EU and Thailand

This section focuses on six analytical frameworks of enterprise liability: the relationship between manufacturers and consumers, the issues of the definition of products, the issues of the definition of defect, the issues of damage, the issues of burden of proof and basis of liability, and the issues of the exemption of manufacturers' liability. Each of the frameworks will compare the new PLD and the Thai Unsafe Products Act.

Each section will begin by introducing the issues through the lens of the analytical frameworks, followed by a discussion and comparison of the new PLD and the Unsafe Products Act. Based on this discussion and comparative analysis, section 6 will examine whether the new PLD is compatible with, or inconsistent with, the concept of enterprise liability. The findings of this evaluation will subsequently form the basis for recommendations on reforming Thai law in accordance with the principles of enterprise liability, using the new PLD as a comparative model.

5.1 The Relationship between Manufacturers and Consumers

The debate around AI actors is gaining traction as the AI sector introduces a new business environment. This sector includes terminology that differs from traditional business, featuring terms like developers, data miners, providers, vendors, end users, and high-risk end users. According to the Organisation for Economic Co-operation and Development or OECD's information on artificial intelligence and responsible business practices, there is an AI actor landscape to consider. Unlike standard physical products, where relationships between manufacturers, supply chains, retailers, and customers are straightforward, the AI landscape is characterised by significant interactions and exchanges among developers, vendors, and end users. This raises ongoing questions about how to assign responsibility to various AI actors involved in the development, sale, or deployment of technological solutions. The OECD defines AI actors as 'those who play an active role in the AI system lifecycle, including organisations and individuals that deploy or operate AI."[31]

[31] OECD, 'Artificial Intelligence & Responsible Business Conduct' (OECD) <https://mneguidelines.oecd.org/RBC-and-artificial-intelligence.pdf> accessed 2 June 2025.

The definition in the AI industry contrasts with that of traditional sectors. In conventional products, manufacturers are the creators; in the AI realm, developers create AI products through a series of steps: ideation (identifying a problem and the AI's priorities), data gathering (choosing the right dataset for the AI to learn from), method selection (deciding how to teach the AI to utilise the data), and performance testing (evaluating the AI's capability to execute the learned tasks).[32] Thus, the role of AI developers mirrors that of manufacturers in traditional industries. Recognising this similarity in product liability could be advantageous, suggesting that AI may be considered products, with developers held accountable for any defects.

This indicates that participants in the AI industry will differ from those in conventional sectors, making traditional terminology potentially obsolete. Therefore, Thai product liability law cannot exclusively rely on specific terms like manufacturers or entrepreneurs in general. There is a necessity to refresh the terminology used in the AI sector.

5.1.1 The New PLD

To understand this definition in the new PLD, one must refer back to Article 1. This is the first time the PLD uses the term 'economic operators' to describe the entities liable for damage suffered due to product liability. A deeper issue with this term arises from AI technology, compelling the Union to identify who should bear responsibility for damages caused by defective products. This term is used in a general sense and is in Article 4 (15), which includes manufacturers as economic operators. It adds more details to expand the scope of Article 3 of the previous Directive, stating that an economic operator means a manufacturer of a product or a component, a provider of a related service, an authorised representative, an importer, a fulfilment service provider, or a distributor.

The definition of manufacturers is articulated in Article 4 (10), and it does not significantly differ from the prior Directive. The term encompasses any individual or entity, whether natural or legal, that engages in the development, manufacturing, or production of a product. This includes those who have a product designed or manufactured, as well as those who market the product under their own name or trademark. Additionally, it pertains to individuals or entities that develop, manufacture, or produce a product for personal use.

[32] Ibid.

It is evident that the obligations imposed on actors in AI technology have significantly increased compared to the previous Directive, as the definition now encompasses developers as manufacturers. This implies that AI developers may be classified as manufacturers in accordance with the new PLD. This is crucial as an AI developer is fundamentally a software expert who designs and integrates AI into applications, enabling automation and data-driven decision-making.[33] The rationale for holding AI developers accountable under the new PLD arises from the revised scope and definitions of the products it contains. This updated terminology refers to the companies that are AI components within software development.

5.1.2 The Unsafe Products Act

What challenges does Thai law present regarding the relationship between manufacturers and consumers in AI liability? The key issue revolves around the terminology and definition of manufacturers within Thai legal frameworks.

As discussed above, AI manufacturers can be categorised in different ways, like operators or providers, depending on the jurisdiction's definitions. Nonetheless, the Unsafe Products Act utilises a single term under statutory law: 'entrepreneurs.'

In *the judgment of the Supreme Court 4567/2561,* the Supreme Court ruled that, regarding the second defendant involved in the manufacturing, assembly, and distribution of the disputed car, despite being a separate legal entity from the dealer and having no direct relationship with the customers who purchased the car, it is evident that the second defendant closely controls and supervises the repair standards of the first defendant, the dealer. As a result, the second defendant, along with the first defendant, is responsible for ensuring the repair and maintenance of the car for the claimant. Thus, the claimant has the right to sue both defendants.

This case illustrates that, although the manufacturer and dealer operate as distinct entities with no direct relationship to the consumer, the manufacturer remains liable for any harm caused to the consumer under product liability. It also demonstrates that the Thai court recognises enterprise liability within the context of Thai product liability. The judgment also concerns the relationship between manufacturers and consumers, despite their lack of direct connection. This indicates that under Thailand's product liability law, a contractual relationship is not necessary; the law of tort governs the relationship between the parties involved in the litigation, as evidenced

[33] Tim Mucci, 'What is an AI developer?' (IBM, 2025) <https://www.ibm.com/think/topics/ai-developer> accessed 17 May 2025.

by the judgment stating that the manufacturer has no direct contact with consumers. The manufacturer is solely responsible for the after-sales duty of repairing and maintaining the car. This establishes a direct contract between the manufacturer and the dealer, which sufficiently demonstrates that manufacturers bear responsibility for consumer harm under the principle of enterprise liability.

However, in Thailand, s 4 of the Unsafe Products Act provides a specific definition of who is liable for consumer harm. The term 'entrepreneurs' is utilised by legislators to include various parties responsible for damages. To determine who qualifies as an entrepreneur under s 7, one can refer to s 4, paragraph 10. "Entrepreneur" refers to the manufacturer, hirer, importer, or seller of goods when the identity of the actual manufacturer, hirer, or importer is undisclosed, or it pertains to an individual who utilises a name, trade name, trademark, or any demonstration that implies they are the manufacturer, hirer, or importer. The term entrepreneur encompasses manufacturers, and the court determines the relationship between manufacturers and consumers.

The rationale behind the Unsafe Products Act aligns with that of the Supreme Court's ruling: it seeks to hold companies accountable, even if there is no direct link, as they benefit from the distribution of products. Legislators incorporate a range of parties in s 4 because these entities can financially gain from these products. The rationale of the court reflects the other concepts in enterprise liability theory, which requires manufacturers to absorb the costs of accidents through the process of internalisation. Section 4 of the Unsafe Products Act uses the singular term, but in fact, it includes all actors in business collectively for the responsibility for the harm caused by products.

The relationship between manufacturers and consumers illustrates that Thai law aligns with the principle of no-fault liability. While a direct relationship may be absent, manufacturers remain accountable for defective products. However, it is evident that the terminology related to entrepreneurs largely excludes various AI entities, as previously mentioned. This terminology primarily addresses conventional products, indicating that Thai law's definitions may be outdated and require updates or additions to effectively encompass AI actors, as recommended by the OECD.

5.2 The Issues of Definition of Products

The definition of products plays a crucial role in the principle of risk distribution. If only certain AI tools are classified as products under enterprise liability, while others

are excluded due to a narrow legal definition, manufacturers may evade accountability for the risks posed by their AI systems. This raises a fundamental question: how can risk distribution effectively govern AI liability if the scope of products is so limited? The issue highlights the importance of refining and expanding the definition of AI-related products.

In depth, the definitions of products and the scope of product liability law seem overly restricted when it comes to AI liability. This creates a legal gap in AI liability because AI does not need to be tangible. An example can be seen in multiple software applications we use daily. This analysis is similar to what Buiten, Streel, and Peitz provide; they offer valuable insights regarding the challenges of adapting AI liability to contemporary tort law.[34] They also examine that the definition of products in the present may not include all types of AI.

5.2.1 The New PLD

The meaning of 'product' in the new PLD, as stated in Article 4 (1), refers to all movables, even those integrated into another movable or an immovable. 'Product' includes electricity, digital manufacturing files, and software. This definition clarifies that there are no complicated issues distinguishing between movable and immovable property. Additionally, the new PLD explicitly states that the product also encompasses electricity, digital manufacturing files, and software, indicating that there is no difference between software on a disc or uploaded to the Cloud; all will be included under this new Directive. The new PLD is also grappling with the complex issue of interpreting 'digital manufacturing file,' 'component,' and 'related service'; thus, it provides additional definitions in Article 4 (2)-(4).[35]

Furthermore, the absence of a clear definition for certain AI products which expains the new technology, including AI chatbots—services or products aimed at reducing the challenges associated with complex decision-making in the future—necessitates an expansion of the scope of Article 2 within the new PLD. This Directive

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[34] Miriam Buiten, Alexandre de Streel and Martin Peitz (n 16) 7.

[35] Article 4

"(2) 'digital manufacturing file' means a digital version of, or digital template for, a movable which contains the functional information necessary to produce a tangible item by enabling the automated control of machinery or tools;

(3) 'related service' means a digital service that is integrated into, or inter-connected with, a product in such a way that its absence would prevent the product from performing one or more of its functions;

(4) 'component' means any item, whether tangible or intangible, raw material or related service, that is integrated into, or inter-connected with, a product".

applies to both products and services. Consequently, it is unnecessary to engage in further discourse regarding the classification of AI as either a product or a service. The concept presented by the European Union is precise and offers a viable solution for both manufacturers and consumers; accordingly, AI across all platforms can now be safeguarded under the Directive.

However, there is a divergence of opinion regarding the solution presented in the Directive. The European Centre for International Political Economy (ECIPE) argues that including software in the definition fails to recognise the fundamental disparities in the risk profiles associated with products and software. Movable products generally possess specific functionalities that entail a predictable spectrum of related risks, allowing manufacturers to foresee the possible risks associated with these products. Self-driving cars have the potential to cause accidents on the road, thereby presenting an opportunity for manufacturers to implement measures to mitigate such risks. Conversely, numerous potential and unpredictable liability risks associated with various use cases may compel companies to limit or cease certain services within the EU.[36] The implication here is that the foundational premise of this argument posits AI as inherently unpredictable, a notion that is evidenced by its defining characteristics. Imposing liability on manufacturers solely for software, devoid of any tangible property, introduces unpredictable risks for these entities. Nevertheless, should one embrace this premise, it logically follows that AI software would be regarded as property devoid of liability, thereby lacking any protective measures for consumers. This outcome contradicts the intended objectives of the Union concerning the principle of enterprise liability.

The doctrine of enterprise liability logically extends to include AI developers responsible for damage caused by their software, considering the current societal trends. As we transition into an AI-driven world, AI becomes increasingly woven into our everyday environments. The role of AI developer is emerging, reflecting the novelty of AI software and its innovations. Therefore, the Directive ought to broaden its definition to encompass new enterprises, which must strategise for incorporating business costs and managing risk allocation in the future.

[36] Matthias Bauer, Director at ECIPE, 'ECIPE Webinar: The Economic Impacts of the Reform of the EU's Product Liability Directive' (The European Centre for International Political Economy, 25 May 2023) <https://ecipe.org/events/ecipe-webinar-economic-impacts-eu-product-liability-directive/> accessed.23 October 2023.

5.2.2 The Unsafe Products Act

One of the most important challenges in the Unsafe Products Act is establishing a definition for products, which is a crucial question. This definition will influence how AI liability is approached in Thailand under the Unsafe Products Act. It is important to recognise that AI is an emerging technology that can offer products or services distinct from traditional options.

For example, consider the process of identifying AI tools available online. A clear instance is the AI chatbot from Character.ai, which enables role-playing as different characters and facilitates conversations with the role-play AI. How should we categorise this kind of business? Is it an intangible product or service, or does it resemble a rental service? This situation prompts a reevaluation of what defective products encompass.

Section 4 of the Act provides definitions for important terms, including the definition of 'product'. Under this definition, products refer to any type of movable property manufactured or imported for sale, including agricultural products and electricity, except for the products specified in the Ministerial Regulations. Additionally, products from agricultural activities, such as farming, animal husbandry, aquatic livestock, silkworm cultivation, lac cultivation, and mushroom cultivation, are included; however, they do not encompass products arising from natural processes. This definition is notably broad. Legislators aimed to encompass all product types in the Act. In particular, any tangible item or entity, including electricity, qualifies as a 'product.' Given that Thailand is primarily an agricultural nation, all agricultural products fall under this definition.

According to the current definition, Thai law seemingly protects only AI that is integrated into physical items or hardware, rather than software that lacks a tangible medium. For instance, self-driving cars can be categorised as physical items or tangible assets. In contrast, intangible items like software that lack a physical medium fall outside the scope of the Unsafe Products Act. The definition in the Unsafe Products Act is outdated, as it currently extends only to tangible or movable products. By contrast, AI tools often combine tangible and intangible elements, such as software or services, including AI agents. Within the rapidly evolving AI landscape, where AI agents are increasingly integrated into everyday life, these gaps in legal definitions are particularly problematic. The law must therefore not only clarify the treatment of AI products but also broaden its scope to encompass AI services. Doing so would help eliminate ambiguity in interpreting what constitutes a product or a service.

5.3 The Issues of the Definition of Defect

The subsequent question pertains to how to determine if the products or services are defective. AI can learn or evolve post-consumption; additionally, proper maintenance, which includes updating antivirus software or firmware, is crucial. Consequently, to assess the presence of a fault, benchmarks must be established for all manufacturers and consumers. This poses a challenge presented by emerging technologies.

5.3.1 The New PLD

Article 7 (1) of the new PLD provides that a product shall be considered defective when it does not provide the safety that a person is entitled to expect or that is required under Union or national law. Article 7 (2) dictates that all circumstances shall be considered when determining defectiveness, including the characteristics of products, reasonably foreseeable use of products, the ability to continue to learn, the expectation that products will be used together with other products, the moment products are put on the market, the relevant security requirements, or the specific needs of the group of users. This provision also mentions that manufacturers retain control over products after sale and that safety requirements, including cybersecurity, should become factors to consider when evaluating product defects.

The new PLD also confirms that the product should not be considered defective solely because a better product, including updates or upgrades, has already been or subsequently is placed on the market or put into service.

The fundamental principles of this concept aim to address the legal gaps present in the prior Directive. The prior Directive lacked defined categories of examples for the determination of defective AI products. The newly introduced Directive outlines an expansive definition of defective products and establishes a comprehensive list for consideration by both the court and the involved parties. The characteristic of risk under discussion is evidently present in this context. Nevertheless, the most compelling aspect lies in the Union's comprehension of the characteristics inherent to AI and the intricacies of the machine learning process. The parties are advised of the necessity to identify the defect while considering the capacity of AI for ongoing learning. The potential of machine learning can lead to products that differ significantly from their initial market introduction.

The control of manufacturers over after-sales services and product safety requirements must also be acknowledged. This consideration stems from the fundamentals

of AI software; machine learning not only empowers AI to evolve but also allows manufacturers to manage software upgrades and updates. Consequently, it becomes essential for manufacturers to enhance or update their products post-sale, and consumers are likewise required to adhere to these safety recommendations. A clear example is smartphones; once these devices are launched and sold, manufacturers are obligated to provide system upgrades or updates. They no longer remain the same products as when they first entered the market.

The new PLD provides an expansive definition and conceptualisation of AI products or services. This suggests that it addresses the challenges and requirements related to identifying a concept for AI products or services designed for Union members and the judiciary. These factors may be seen as elements that consumers need to present in a legal context, regarding the characteristics and expectations associated with those products and services, as well as their capacity for learning. Numerous questions remain to be defined at the national levels. The new PLD's text serves as the foundation for a comprehensive framework within national law.

Article 7 (3) addresses the defence related to development risk. The article asserts that a product cannot be deemed defective solely because a superior product, incorporating updates or upgrades, has already entered the market or has been put into service subsequently. This article posits that innovation is fostered, claiming that the mere existence or later emergence of a superior product should not automatically imply that the original product is defective. Furthermore, the provision of updates or upgrades should not be interpreted as an indication that an earlier version of the product is inherently flawed. This pertains to the conceptual framework of the European Union, which contrasts with that of Thailand.

5.3.2 The Unsafe Products Act

The concept of a defective product is a key issue in the litigation, as it influences how consumers assess their damages. According to s 4, Paragraph 7, unsafe products are those that can cause harm or may cause harm due to a manufacturing defect, a design defect, lack of instructions, inadequate warnings, or misleading information about the product, including its normal use and care. This definition of unsafe products takes a comprehensive view of defective items. As a result, a product could be classified as defective due to a design defect, manufacturing defect, or insufficient warnings and instructions.

The problem of defective products is not simply that it is linked to the issue of the burden of proof, which manufacturers normally have more information about and acquire more knowledge than consumers. This makes it difficult for consumers to prove product defects. Especially in AI liability, the characteristics of AI are complex, opaque, and autonomous. It is challenging for consumers to demonstrate the malfunctioning of AI under specific conditions. Furthermore, in cases where consumers must prove design defects, this becomes the most challenging issue, as it necessitates that consumers demonstrate the software system and machine learning aspects of AI. This is the burden borne by consumers, not unlike proving a fault in a fault-based system.

Currently, Thai law lacks guidelines to help consumers evaluate product defects. The determination of product defectiveness depends on the factual evidence presented by consumers and the subjective understanding of the presiding judge. In the context of AI liability, this situation becomes even more problematic, as consumers are expected to have more specialised knowledge and evidence to prove that AI products are defective. This creates an issue of information asymmetry, similar to what has already been seen in fault-based theory.

5.4 The Issues of Damage

The issue of damage is directly tied to the principle of internalisation, as manufacturers are in the best position to absorb harms resulting from AI. Damage plays a crucial role because the law determines which types of harm manufacturers must bear, reflecting how the state allocates risks between manufacturers and consumers. If the state refuses to recognise certain forms of damage, the burden will inevitably fall solely on consumers. For this reason, the principle of responsibility should serve as the guiding standard in evaluating the effectiveness of laws under the framework of internalisation. Merely providing compensation for consumers under the law is insufficient, as the range of potential harms caused by AI extends beyond those associated with conventional products. These include, for example, damage to data or mental health. Current product liability laws across jurisdictions do not necessarily impose responsibility on manufacturers for such novel categories of harm, thereby revealing significant gaps in addressing AI liability.

5.4.1 The New PLD

There is a new challenge in the definition of damage in the new PLD. In Article 4 (6), the term 'damage' is defined to include all damage related to death or personal injury, including medically recognised harm to psychological health; harm to or destruction of any property; and loss or corruption of data that is not used for professional purposes. It can be seen that both physical and psychological harm are included as 'personal injury' in this definition. Compared to previous versions that use the term 'personal injury' and leave the interpretation to Member States, this new definition confirms that psychological health is included in the definition of damage.

For that reason, damage caused by self-driving cars and AI chatbots can be claimed under Article 6. Consumers of self-driving cars can claim damages for death and personal injuries, such as bodily harm, from the manufacturers, while consumers of AI chatbots can claim damages for psychological health damage. Other losses, such as defamation, may also be included under circumstances of loss or corruption of data that is not used for professional purposes. Article 6(1)(C) confirms that this Directive will not cover users acting for professional purposes concerning property damage and data corruption.

'Damage' appears as another matter that generates divergent viewpoints. ECIPE opposes the Directive to incorporate psychological health and mental disease within the criteria. In their view, psychological health and mental illness represent intricate forms of impairment to evaluate, as medical practitioners' perspectives sometimes vary significantly.[37] The point of view of ECIPE appears limited, as it neglects significant concerns and the scientific technology pertinent to the analysis of psychological injury. Psychological health is very complex, as it is not visibly apparent; yet medical practitioners possess theories and methodologies to substantiate the existence of mental disorders. The case of Eliza, referenced in the preceding chapter, demonstrates that psychological disorders induced by AI manifest in reality and can be substantiated; thus, it is appropriate to incorporate such harm within the Directive.

A further issue is the 'loss or corruption of data'; this concern arises from the necessity of safeguarding customers. It can be argued that the incorporation of 'data' is essential to protect consumer rights and to prevent manufacturers, producers, or suppliers from utilising such data beyond the contract's boundaries. ECIPE contends that this policy is ambiguous due to the inherently subjective nature of personal data valuation, which varies by individual. Moreover, the damages stemming from the loss

[37] Ibid.

of personal data are extremely difficult to define, complicating the courts' ability to assess them objectively value.[38] This issue features divergent perspectives from the European Consumer Organisation (BEUC). BEUC endorses the Directive and also raises concerns that malfunctioning devices may not only adversely affect the physical environment but also compromise data held on devices, including mobile phones. Inadequate cybersecurity should be considered a flaw.[39]

From an alternative viewpoint, it is evident that tension arises between manufacturers and consumer stakeholders. The definition of personal data differs among individuals. Manufacturers may perceive data only as 'information' for training machine learning models. Conversely, from the consumers' perspective, this information is invaluable; its loss to third parties might adversely affect their personal lives. For instance, AI software enables malicious third parties to access connected devices and steal or duplicate important information. This circumstance may result in financial loss or reputational harm. Manufacturers are obligated to safeguard consumers' personal data to reconcile the interests of both parties. It is fundamental that business enterprises are responsible for protecting consumers' personal data, as they are well-positioned to prevent harm. Discussing the utility of information is pointless; the primary issue is that producers have a duty to prevent harm from the very beginning.

5.4.2 The Unsafe Products Act

In Thai product liability law, there is clearly no protection against data loss or destruction. This is due to the fact that, under current regulations, data is not classified as a product. Meanwhile, UNESCO's recommendations on artificial intelligence ethics highlight that data policy should be a priority for all members. It is common for Member States to aim at developing data governance strategies that ensure a continuous assessment of the quality of training data for AI systems. This includes evaluating the adequacy of data collection and selection processes, implementing proper data security and protection measures, and establishing feedback mechanisms to learn from errors and share best practices across all AI stakeholders.[40]

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[38] Ibid.

[39] The European Consumer Organisation, 'REVISION OF THE PRODUCT LIABILITY DIRECTIVE Time to ensure effective and comprehensive protection for consumers damaged by defective products.' (The European Consumer Organisation) 9-10 <https://www.beuc.eu/sites/default/files/publications/BEUC-X-2023023_Revision_of_the_product_liability_directive.pdf> accessed 24 October 2023.

[40] UNESCO, Recommendation on the Ethics of Artificial Intelligence (2022) 29 <https://unesdoc.unesco.org/ark:/48223/pf0000381137.locale=en> accessed 2 June 2025.

Consequently, data remains a central focus for AI technologies, making it essential for Member States to implement policies that protect data and the rights of AI users. Additionally, this recommendation emphasises the critical need for safeguarding sensitive data and ensuring the appropriate level of data protection.

While Thailand has the Personal Data Protection Act B.E. 2562 (2019), which aims to safeguard citizens' personal information, it mainly focuses on general data protection. The Act does not address the dynamics between manufacturers and consumers concerning product liability, as the legal framework relies on a fault-based system. Its protections relate specifically to how data controllers collect and disclose personal data. However, it fails to mention consumers' rights to seek compensation for data destruction or loss, revealing a notable difference in legal perspectives. Ultimately, this Act emphasises individuals' privacy rights over consumers' protection against data loss or destruction.

This issue suggests that the Personal Data Protection Act B.E. 2562 (2019) can be aligned with UNESCO's policy to some extent, but it requires improvement and modification to meet all expectations for consumer protection in AI liability.

Concerning damages, Thailand's Unsafe Products Act addresses several critical issues that remain absent in English law. Under the dimension of responsibility, Thai legislation covers both physical and psychological injury and even permits punitive damages in cases of manufacturers' gross negligence. The *Mazda*[41] case illustrates how Thai courts apply these provisions in practice, confirming the Act's relevance to conventional products such as motor vehicles. This demonstrates that Thai law adopts a broader perspective of responsibility, aiming to distribute risks more equitably by placing obligations on manufacturers rather than leaving consumers to bear the full burden of harm.

However, these strengths diminish in the context of AI. When consumers suffer harm through AI tools, such as AI chatbots, demonstrating damage and causality becomes significantly more complex. Typically, the only available evidence consists of chat interactions, which must somehow be framed as proof of defect. This evidentiary difficulty highlights the increasing importance of the burden of proof; a matter explored in the next section.

A further and more pressing challenge in the digital age is the risk of damage to personal data, whether through destruction, corruption, theft, or illicit sale.

[41] Chonburi Provincial Court Red Case No. 131/2567 (Thailand).

Thai law has not yet provided sufficient safeguards in this area, despite the fact that AI systems frequently rely on consumer data as a primary resource. The absence of legal mechanisms addressing these risks means that the dimension of risk allocation under Thai law loses much of its effectiveness, leaving consumers exposed to harms not contemplated under conventional product liability.

In contrast, the new PLD represents a more advanced model. It explicitly extends liability to digital content, software updates, and AI-related harms, ensuring that damages such as data loss or corruption can be recognised within the liability framework. By broadening the scope of responsible actors beyond manufacturers to include developers, providers, and other AI stakeholders, the PLD enhances consumer protection under the principle of liability without fault.

To address these shortcomings, reforms to Thailand's Unsafe Products Act are urgently needed. Such reforms should expand the scope of damages to encompass data-related harms and clarify the liability of AI stakeholders across the supply chain. Drawing from the PLD's broader approach, Thailand could strengthen its product liability regime to respond more effectively to the distinctive risks posed by AI systems. This would not only restore the significance of risk allocation under Thai law but also ensure greater fairness for consumers in the digital era.

5.5 The Issues of Burden of Proof and Basis of Liability

The burden of proof is a key challenge in enterprise liability. Several changes in this new PLD are absent from the earlier version. This marks an innovation in the doctrine of product liability within enterprise liability in the European Union.

The issues of the burden of proof are closely tied to the principle of internalisation, which holds that manufacturers should bear the costs of evidence gathering and litigation. In the context of enterprise liability, this raises fundamental questions concerning both the burden of proof and causality. These dimensions are particularly significant because scholarly discussions of enterprise liability often emphasise no-fault liability yet tend to overlook the practical challenges of proving defect. Establishing that a product is defective and demonstrating the causal link between the defect and the damage are complex tasks. These challenges are amplified in cases involving AI liability, where opacity and unpredictability make proof even more difficult. Consequently, unless the law restructures the rules governing the burden of proof and causality, it cannot be regarded as an effective framework for AI liability.

5.5.1 The New PLD

5.5.1.1 The Rules of Disclosure of Evidence

This issue is important and perhaps the most significant in this new PLD. The European Union recognises the problem raised by the previous Directive in the procedural process. Although the previous Directive was presented as no-fault liability, Article 4 provides that consumers must prove the damage, the defect, and the causal relationship between the defect and the damage. It suggests that consumers still bear the burden of proof.

The new PLD sets forth rules for disclosing evidence to tackle issues in court related to the burden of proof for consumers. According to Article 9, courts can require defendants to provide relevant evidence when requested by consumers. Should manufacturers neglect to fulfil the duty of disclosing essential evidence, it will be assumed under Article 10(2)(a) that the product is defective. This provision represents a fundamental right for consumers in the new PLD and aims to establish an information balance between the parties. It seeks to ensure that the claimant, as a consumer, has access to information and evidence from the defendant. ECIPE suggests that the demand for additional evidence indicates a need for more thorough assessments involving legal professionals and insurance companies.[42]

According to ECIPE, businesses need to be prepared for the risks and costs associated with evidence disclosure. This concern stems from the implications of revealing information about technology, trade secrets, and confidential data. This perspective is justifiable, as they hold sensitive business information, and the court cannot guarantee complete security measures during legal proceedings.

Business stakeholders may have objections to the rules concerning evidence disclosure; however, this does not imply that consumer stakeholders share the same view as the Directive. BEUC seems to oppose the existing conditions for evidence disclosure, primarily due to the high costs of hiring legal experts for consumers pursuing lawsuits. They advocate that to better serve consumers and improve the chances of winning a case, the Directive should allow evidence disclosure before a compensation lawsuit is filed. Additionally, they argue that economic operators must present the disclosed information in a manner that is accessible and understandable to consumers.[43]

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[42] Matthias Bauer (n 37).

[43] The European Consumer Organisation (n 40) 14.

The Directive aims to find a balance between the interests of manufacturers and consumers. When a consumer files a lawsuit, companies are required to share relevant information. While consumers have the right to request evidence, they also need to take accountability for their actions in court. If the new PLD allows consumers to seek information without the need for a lawsuit, it could create significant challenges for companies, resulting in increased costs for legal fees, insurance, or operational expenses. Moreover, companies frequently possess trade secrets, which means they are not obligated to share all information that consumers may desire. The request from BEUC is excessive and somewhat unfeasible.

From ECIPE's viewpoint regarding the substantial expenses associated with legal professionals and insurance companies, it is crucial that, from the very beginning, there exists a responsibility to internalise these costs under the framework of enterprise liability related to internalisation. It can be contended that the pricing of products may rise; however, there exists the capacity to allocate costs across customers. Consequently, their argument fails to meet acceptable requirements.

The regulations concerning evidence disclosure will be enforced to improve knowledge sharing between consumers and manufacturers. While this does not ensure that consumers will receive all the evidence they require, it does offer assurance that the rule shifting the burden of proof will work in situations where manufacturers do not supply the essential evidence in court.

5.5.1.2 The Reverse of Burden of Proof

The rules regarding the burden of proof in the new PLD are outlined in Article 10. It specifies that a claimant is required to prove the defectiveness of the product, the damage suffered, and the causal link between the defectiveness and the damage. These are the conditions for consumers as claimants to establish a claim.

However, this new PLD does not leave consumers without support, as was the case in the previous Directive. The new PLD establishes a presumption of causality. Under specific conditions, the court can presume that products are defective without any demonstration, as stated in Article 10 (1). For example, manufacturers as defendants may fail to disclose evidence, products may not comply with mandatory product safety requirements, or products may have been caused by an obvious malfunction.

The significance of these presumptions becomes evident when compared to the previous Directive, which did not succeed in establishing a definitive presumption for shifting the burden of proof. Given these assumptions, it is mandatory for manufacturers to provide evidence that their products are devoid of defects.

In Article 10 (4), the Directive intends to provide rules for national courts that they should also presume the defectiveness of a product or the causal link between the damage and the defectiveness, or both, where, notwithstanding the defendant's disclosure of information, it would be excessively difficult for the claimant, in light of the technical or scientific complexity of the case, to prove its defectiveness or the causal link, or both. The concept of this provision arises from the complex nature of products in the digital era. For example, consider an innovative medical device: the intricate technology involved, such as machine learning; the complex information and data analysed by the claimant; and the nuanced causal link, such as the relationship between a pharmaceutical or food product and the onset of a health condition. This link, to be substantiated, requires the claimant to clarify the inner workings of an AI system.[44] In practical terms, it is extremely challenging for consumers to understand this complicated issue. While Article 9 provides for the disclosure of evidence, it remains likely that both the court and consumers may ultimately lack a comprehensive understanding of the complex technology presented by manufacturers. It is reasonable to assert that manufacturers bear the responsibility to demonstrate the absence of defects in their products, particularly when they are unable to present their technology to potential users.

The stakeholders within the industry contend that the Directive, which employs a strict liability approach, is already characterised by a 'challenging' standard. They contend that this Directive employs a framework of 'strict liability'.[45] Industry stakeholders seem to express concern that an excessively difficult standard may become the primary criterion that the courts will use in adjudicating the case. This concern appears to be valid.[46] The concept of excessive difficulties serves as a significant principle that, when invoked by the Court in a particular case, has the potential to shift the burden of proof. Furthermore, when national courts prioritise consumer protection, they often apply rules consistently across various cases, leading to the exception rule evolving into a standard practice and becoming obligatory.

While Article 10 (2) presents numerous assumptions for shifting the burden of proof regarding defective products, no article explicitly states a reversal of the burden

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[44] European Commission, Proposal for a Directive of the European Parliament and of the Council on liability for defective products 2022 34 <https://eur-lex.europa.eu/resource.html?uri=cellar:b9a6a6fe-3ff4-11ed-92ed-01aa75ed71a1.0001.02/DOC_1&format=PDF> accessed 19 October 2023.

[45] Matthias Bauer (n 37).

[46] Ibid.

of proof within the Directive. The burden of proof will only shift under the specific conditions outlined in Articles 10 (2), (3), and (4).

It is indeed reasonable to assert that the new PLD endeavours to achieve a balance between fairness and benefits for both manufacturers and consumers. The European Union recognises that a fault-based system may result in adverse consequences for consumers. The asymmetry of information constitutes a pivotal element in the analysis. Subsequently, they establish various conditions aimed at shifting the burden of proof. The notion of enterprise liability within this new PLD seems to exert a more significant impact compared to its predecessor. Manufacturers bear a multitude of responsibilities, including the obligation to disclose evidence and the circumstances that could result in a shift in the burden of proof. Nevertheless, these conditions arise from the elevated technological standards characteristic of the digital age, which remain largely incomprehensible to the average consumer. In contrast, manufacturers possess a deeper understanding of these complexities, allowing them to derive greater profit from such insights. In this context, it is justifiable to place the burden of proof regarding defective products upon them.

5.5.2 The Unsafe Products Act

Section 6 of the Unsafe Products Act states that the injured person must prove that they have suffered damages caused by the entrepreneur's products and that the usage or preservation of those products is inherent to their nature. However, it is unnecessary to prove which entrepreneur caused the damage. This means that for a claim, the victim only needs to demonstrate that the use or storage of the product was conducted in a customary manner.[47]

This section indicates that consumers are not required to prove manufacturer fault. The duty of proving that products are defective remains with consumers. To discuss the burden of proof, it is essential to reference s 29 of the Consumer Case Procedure Act, which grants the court the authority to shift the burden of proof from consumers to manufacturers. If the court determines that the case requires specialised knowledge of manufacturers. This indicates that manufacturers bear the burden of proof regarding the non-defectiveness of their products, shielding them of responsibility towards consumers.

[47] Section 5 "All entrepreneurs shall be jointly liable for damages occurring to the damaged party from an unsafe product sold to the consumer. This shall apply to intentional damages or damages arising from the negligence of the entrepreneurs".

In *the judgment of the Supreme Court No. 4567/2561*,[48] the court confirmed that it is the duty of the defendants to prove that they had properly repaired the defects of the disputed car. Because they cannot prove those facts, the two defendants must jointly be liable for the defects of the disputed car. This is supported by *the judgment of the Supreme Court No. 2764/2565*.[49] Consequently, administering biomolecules to the body qualifies as a medical service that falls under the expertise of the litigant who operates as a business. Therefore, the responsibility to provide proof regarding this matter lies with the first and second defendants. These instances illustrate the Supreme Court's application of the reverse burden of proof, suggesting compatibility with the Thai legal system.

In *the judgment of the Supreme Court No. 4829/2558 (2017)*[50] case, a consumer purchased a bag of jasmine rice contaminated by fungus. The Supreme Court ruled that the defendant had to prove that the manufacturing process met acceptable standards. In this case, the Court determined that the burden of proof is reversed under the Act. However, the final outcome of this case is that when the defendant can prove that products met the standards under Article 7 (1), there is no liability.[51]

This case illustrates that the reversal of the burden of proof is essential and beneficial for both manufacturers and consumers. Consumers often lack specialised knowledge, such as how to assess the quality of jasmine rice, while manufacturers possess a comprehensive understanding. The responsibility of demonstrating product quality does not disadvantage manufacturers; instead, it enables them to highlight their products' quality and prove that they are not defective. The substandard quality of the jasmine rice could stem from design flaws during processing, issues with a specific batch, or improper storage by consumers. In this scenario, the manufacturer effectively shows that enterprise liability does not equate to absolute liability. Rather, it represents a fair system.

When it comes to AI liability, the burden of proof is essential given the complexity, lack of transparency, and independent nature of AI. The processes by which AI generates outcomes or inflicts harm on consumers are often unclear. These factors create a legal void in litigation. Applying s 6 of the Unsafe Products Act and s 29 of the Consumer Case Procedure Act to AI liability may compel manufacturers to demonstrate

[48] Supreme Court Decision No. 4567/2561 (Thailand).

[49] Supreme Court Decision No. 2764/2565 (Thailand).

[50] Supreme Court Decision No. 4829/2560 (Thailand).

[51] Ibid.

the functionality of their AI systems, which is preferable to placing the onus on an average consumer or attorney to undertake extensive investigations into AI.

Although Thai law allows judges to shift the burden of proof between parties, this discretion derives from the Consumer Case Procedure Act rather than the Unsafe Products Act, which is the primary legislation governing defective products. While this arrangement reflects an attempt to align with the principle of enterprise liability by creating the possibility of reversing the burden of proof, its fragmented structure undermines coherence and practicality. A more effective solution would be to amend the Unsafe Products Act itself by explicitly incorporating provisions on burden shifting.

A further difficulty arises from the broad judicial discretion to decide when the burden of proof should be reversed. While this can benefit consumers by requiring manufacturers to prove that their products are not defective—the absence of clear criteria renders the system unpredictable and potentially unfair. Parties are left uncertain as to how judges will exercise their discretion, undermining legal certainty.

Even when the reverse burden of proof is applied, Thai law does not provide presumptions of causality. This omission becomes critical in AI liability. Given AI's complexity, autonomy, and opacity, establishing a causal link is particularly challenging. Consumers face severe disadvantages due to information asymmetry and the financial resources available to manufacturers, making it nearly impossible to prove both the defect and its causal connection to the harm.

To address these shortcomings, Thai law requires new guidelines that integrate both the burden of proof and causality under the principle of internalisation. The EU's new PLD offers a valuable model, as it introduces explicit rules on evidence disclosure and presumptions of causality, thereby reducing evidentiary barriers and improving fairness for consumers. Incorporating similar provisions would allow Thai law to better accommodate the unique risks posed by AI systems and strengthen the overall effectiveness of its product liability regime.

5.6 The Issues of the Exemption of Manufacturers' Liability

The development risk defect contrasts with a core concept in traditional tort law, which mainly concerns liability for physical injuries and is based on foreseeability.[52] Typically, a defendant is only held liable for harms they knew or should have known

[52] Patrick F. Hubbard, 'Allocating the risk of physical injury from "sophisticated robots": Efficiency, fairness, and innovation' in Ryan Calo, A. Michael Froomkin and Ian Kerr (eds) *Robot Law* (Edward Elgar 2016) 27.

about at the time of their actions.[53] However, truly AI systems—especially those that learn and adapt in unpredictable, nonlinear ways—pose a challenge to this approach. This unpredictability makes it difficult to apply existing tort principles like negligence, design defect, or failure to warn, since the specific harms might not have been foreseeable during design or manufacturing,[54] due to the lack of relevant scientific knowledge.

Hubbard and Karnow explore issues concerning manufacturing and design defects. Traditional liability for manufacturing defects is strict and applies when a product diverges from its intended design.[55] However, for AI systems that rapidly deviate from standards during on-the-job learning, this liability is less clear. Liability generally does not extend to changes made after delivery unless those changes were foreseeable.[56]

Their discussion highlights the unpredictable characteristics of AI, which in turn raises arguments concerning the development risk defence. This exemption clause applies when, at the time a product was placed on the market, put into service, or remained under the manufacturer's control, the existing scientific and technical knowledge was insufficient to detect the defect. In such circumstances, no reasonable actor anywhere in the world could have identified the harm or defect, making it impossible for manufacturers to prevent consumer injury. Consequently, the costs of prevention cannot realistically be incorporated into manufacturers' internalisation processes. The state should therefore recognise this limitation and establish official measures that protect manufacturers, while at the same time ensuring a balanced approach that safeguards consumer interests and promotes societal progress.

5.6.1 The New PLD

Generally, the liability exemption in the surface appears similar to the previous version. Article 11 outlines liability exclusions where the defendant can demonstrate specific conditions. For instance, a manufacturer shall not be held liable if it did not place the product on the market, if the defect that caused the damage was not present when the product was placed on the market, or if the defect arose from compliance with mandatory regulations issued by public authorities. However, manufacturers cannot evade liability for deficiencies related to services, software

[53] Ibid 34.

[54] Ibid 27.

[55] Ibid 36.

[56] Curtis E.A Karnow, 'The application of traditional tort theory to embodied machine intelligence' in Ryan Calo, A. Michael Froomkin and Ian Kerr (eds) *Robot Law* (Edward Elgar 2016) 68-69.

upgrades or updates, failure to provide upgrades or updates, and substantial product modifications, as these fall under their control. For example, manufacturers of self-driving cars still provide software updates or upgrade systems for cars after consumers purchase them. For this reason, manufacturers still control the AI systems in these vehicles. In the case of AI chatbots, it is clear that they continue to learn through machine-learning algorithms.

The concept of this provision comes from the new notion of technology, which makes manufacturers responsible for the entire life cycle of AI products. The European Union needs to avoid the possibility of economic operators proving that a defect arose after they placed the product on the market, especially when a product's defectiveness consists of the lack of software updates or upgrades. It is necessary for manufacturers to address cybersecurity vulnerabilities and maintain the product's safety.[57]

Nonetheless, this provision might face issues regarding the burden of proof in the future. Manufacturers may claim they have already offered an upgrade or update software, but if consumers did not follow through, this raises doubts about any defects in the device. If they can substantiate this claim, the blame could fall on the consumer. For instance, with AI chatbots, the manufacturer is responsible for updating the software to provide new information or enhance security for users. However, it is also the consumers' duty to upgrade their devices or software. This arrangement is fair and equitable for both parties. Manufacturers are obliged to be accountable for AI products throughout their lifecycle, but they cannot be held responsible for consumer actions, which are beyond their control.

The significant issue that follows the public consultation is that business stakeholders opposed removing the development of risk defence.[58] In Article 11 (e), it is the exemption afforded to manufacturers for developments that were scientifically and technically undiscoverable at the time. This provision continues to use concepts from the previous Directive. In the interests of a fair apportionment of risks, it is suggested that manufacturers should also be exempted from liability if they prove that the state of scientific and technical knowledge is determined based on the most advanced level of objective knowledge accessible, rather than the actual knowledge of the manufacturer in question.

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[57] European Commission (n 45) 38.

[58] Ibid 9.

However, BEUC opposes this exemption of liability. In their view, AI differs from typical products because it does not restrict liability to the time until the product is placed on the market but extends liability for the duration during which the product remains under control of the manufacturer.[59] This argument of consumer stakeholders appears to be reasonable.

The argument between manufacturers and consumers can be analysed within the context of AI technology development. The rationale presented by BEUC is valid; nonetheless, the new PLD inherently broadens the liability of manufacturers in instances where they retain control over AI. This implies that the development and updating of software is not only essential but also obligatory for them as stipulated in Article 11 (2). It is illogical to presume that all products possess inherent protection.

This does not imply that hardware defines a product with an indefinite lifespan; take mobile phones, for example. Manufacturers have the capability to update versions of AI software; however, the implementation of new technology necessitates substantial hardware capacity. Consequently, an older model of a mobile phone, which is constrained by limited memory space, is unable to support the installation of the latest AI software version. While BEUC may emphasise AI software, it is noteworthy that the discussion overlooks the significance of hardware in this context. In the context of AI chatbots, it is evident that developers possess the capacity to continually release updated versions until these chatbots ultimately cease to be viable in the market. Nonetheless, self-driving vehicles necessitate the physical components inherent to automobiles; while the AI software is subject to updates, the fundamental hardware, comprising the car's structure, remains immutable. Their resemblance to conventional automobiles necessitates the continued development of risk mitigation strategies in this context.

5.6.2 The Unsafe Products Act

There is no liability exemption under Thai law. The legislative framework, therefore, places strong emphasis on the protection of consumer rights. In contrast, the European Union seeks to strike a balance between the interests of consumers and those of manufacturers.

Stakeholders generally acknowledge that, absent any form of exemption, manufacturers may be deterred from investing in research and development. This is

[59] The European Consumer Organisation (n 40) 18.

due to the potential liability they may face for defects in earlier versions of products, particularly when newer versions are introduced to the market. Such risks may discourage innovation and technological advancement.

Accordingly, the European approach reflects a policy choice that seeks to balance consumer protection with the promotion of innovation. This highlights the broader tension between safeguarding consumers and fostering societal progress. These objectives are inherently in conflict.

It is therefore essential to promote a balanced and equitable allocation of risk within the framework of enterprise liability, ensuring that both consumer protection and innovation are adequately supported.

6. Compatibility and Inconsistencies between the European Product Liability Directive and Enterprise Liability in the Context of AI

6.1 Compatibility with Enterprise Liability Principles

6.1.1 Modernisation for AI Products/Services

This new PLD represents a significant advancement in the legal framework governing product liability within the context of the digital era. The primary concerns involve broadening the Directive's scope to encompass services, as well as revising the definition of products to incorporate intangible property alongside tangible assets. The modifications implemented guarantee that AI products or services are encompassed within the scope and definitions established by this Directive. The nature of software will not present any complex issues.

The applicability of certain AI software, including AI chatbots, under this new PLD raises important considerations. These entities, which do not clearly define themselves as either products or services, nonetheless align with the scope and definitions established by the new PLD. Furthermore, this Directive introduces a multitude of new definitions related to AI liability, including terms such as digital manufacturing files, data, and online platforms. It can be inferred that manufacturers assume the role of developers.

These terms apply to AI or digital products and services. The term 'economic operator' notably captures the notion of enterprise liability within this Directive, as it

encompasses a wide array of participants in the business ecosystem, including manufacturers, providers, and distributors. Each of these entities can be regarded as organisations that offer products and services to consumers. Entities that derive profits from advanced technology bear a responsibility for the potential harms associated with their products and services.

6.1.2 Enhanced the Definition of Damage

The subsequent strength of the Directive lies in its refinement of the definition of damage. The prior Directive addressed only damages associated with personal injury in a broad sense. Nonetheless, this new Directive encompasses provisions for damages related to consumers' psychological health, as well as for the destruction and corruption of data.

The two issues presented warrant considerable attention from consumers. In the context of psychological health, it is evident that AI has integrated itself into the fabric of daily life, with consumers engaging with AI in various scenarios. This illustrates AI's potential negative impact on consumers' mental health. It is essential for the state to acknowledge this form of harm. This Directive will define damage to encompass not only physical harm but also psychological harm.

The issue of data protection presents significant challenges in the contemporary digital landscape. Given that businesses are required to utilise data for the training of AI systems, it follows that data has assumed a significant value and is now regarded as a valuable asset in its own right. To facilitate the progression of AI technology, it is essential that individuals engage in the sharing of their data. Organisations utilise data to achieve financial gains as well as advancements in research. Consequently, it is mandatory that they safeguard data and regard it as confidential information that is the property of the consumer. In the context of enterprise liability, it is evident that the enterprise occupies a unique position that enables it to effectively mitigate potential harm.

6.1.3 Enhanced the Definition of Defect

This point arises from the challenge of defining defective products, a matter that the previous Directive addresses rather broadly, depending on consumer expectations and safety considerations.

Indeed, the new criteria are outlined in Article 7 (1). Nevertheless, the Directive expands the criteria for determining the defectiveness of products or services.

The Directive considers product characteristics, including design and technical features. Furthermore, the application of this Directive regarding AI liability underscores the significance of safety requirements and emphasises the manufacturer's oversight of products throughout their entire life cycle.

The elaboration of these definitions enhances the prior definition, which lacked clarity and depth. The provided definitions and contextual factors concerning defective products aim to help consumers recognise such products, while simultaneously offering the courts additional criteria for determining the presence of a defect. Under the framework of enterprise liability, the definition of defect takes on significant importance, suggesting that the Directive contemplates the potential for manufacturers to inflict harm upon consumers in relevant situations.

6.1.4 The Disclosure of Evidence and The Reverse of the Burden of Proof

The combination of the rules for disclosing evidence and the burden of proof—two notable elements—contributes significantly to the advancement of innovations in product liability. The discussion surrounding evidence is undoubtedly grounded in the concept of enterprise liability, which seeks to balance consumers' and manufacturers' knowledge. In product liability cases, the absence of knowledge often presents a significant challenge for consumers. The implementation of rules regarding evidence disclosure represents a major advancement aimed at benefiting consumers. Manufacturers have an obligation to support the evidence presented. This evidence can indeed demonstrate that their products or services are free from defects, and it may also establish their lack of liability.

Article 10 defines the burden of proof, asserting that while the fundamental principle mandates consumers to establish the defectiveness of products, the damage, and a causal link between the defectiveness and the damage, these elements can be interpreted as necessary components for substantiating a fault within the framework of fault-based theory. Article 10 (20(3) and (4)) highlights specific exemptions that allow the reversal of the burden of proof, thereby presuming the defectiveness of the product. The issues encompass manufacturers' lack of transparency regarding evidence, failure to adhere to mandatory safety standards, or harm resulting from a clear malfunction. The provision of this rule regarding excessive difficulties for consumers and the courts is noteworthy, as certain technologies present complexities that exceed the average

individual's capacity for comprehension. Under these conditions, it relies upon manufacturers to demonstrate that their products are free from defects.

The combination of Articles 9 and 10 establishes a regime of strict liability within this Directive, which is significant and aligns with the principles of enterprise liability in contrast to its predecessor. This serves as a model of the Directive that can be adopted and adapted by countries outside the Union.

6.1.5 The Development Risk Defence

This clause remains appropriate for inclusion in the new PLD, notwithstanding potential consumer disagreement. The rationale for the development risk defence is that it encourages innovation and establishes an equilibrium between manufacturers and consumers. The new PLD further restricts the application of this defence in cases where manufacturers retain control over software upgrades or are required to demonstrate technological safeguards. Consequently, the development risk defence functions as a preventive mechanism for manufacturers against unforeseen harm.

6.2 Inconsistencies with Enterprise Liability Principles

6.2.1 Increased Business Costs

The primary issue lies in the weaknesses of the new PLD. The Directive enhances security and elevates consumer protection, posing a challenge for enterprises; for example, in complying with business requirements related to confidential information or litigation. Manufacturers of the largest scale may need to augment their expenditures for investment, research, and legal proceedings. Nonetheless, it may present a challenge for small and medium-sized firms (SMEs) that may be lacking in resources to execute the requisite measures. This will result in an imbalance among market participants, necessitating the intervention of competition laws to resolve these concerns. Upon the transposition of the Directive into national law, it will be imperative for the country to establish an adequate equilibrium between innovation and consumer protection.

6.2.2 Challenges in Proving Non-Defectiveness for Enterprise

Although the burden of proof is the focal point of this Directive, it has also turned into a significant challenge for manufacturers. They must adhere to Articles 9 and 10 concerning evidence disclosure rules, and they must also address the clause of excessive difficulties, which may become a requisite provision in litigation. Due to the complexity of AI technology and machine learning, explaining the outcomes poses a

significant problem for both the judiciary and consumers to comprehend. While the standards governing evidence disclosure appear to be crucial in this Directive, there is apprehension that the exemption for excessive difficulties will impose an even higher burden on European enterprises.

6.2.3 No Punitive Damages

The new PLD aims to establish additional standards for business liability; however, it does not allow for punitive damages. The concept of damages in European Union pertains exclusively to actual damages; thus, punitive damages are not included in the Directive.

7. Recommendations for Reforming Thai Law

This section recommends revising Thai law by adopting the new PLD, which incorporates the fundamental principle of enterprise liability. It may be utilised in the new PLD to provide an additional statutory framework concerning AI liability. These reform ideas are best practices that Thai legislators should examine to enhance Thai product liability law.

7.1 Statutory Redefinition of "Product" and Expansion of the Scope to "Service"

The first and most significant aspect is the redefinition of a product. A product in Thai product liability law, particularly the Unsafe Products Act, adheres to the traditional definitions. Although it includes both agricultural products and electricity, it lacks the nature of technology as outlined in the new PLD. For that reason, the product in Thailand should be redefined to encompass all movables, even if interconnected with, or related to, another movable or an immovable; it includes electricity, digital manufacturing files, raw materials, and software. The previous definition remains applicable for safeguarding various product types; this serves as additional clarification that software and digital manufacturing files are included under the AI liability regulation.

Another significant concern is the scope of the law—it must protect customers against defective products while also extending protection to services. This perspective considers both products and services as assets in the economic market, available for sale or rental to consumers. With the expansion of the scope to include services, no concerns will arise regarding the differentiation between products and services. All

forms of AI, such as software, digital services, and autonomous AI systems, will be covered under the legislation.

When Thailand adopts the new scope of the law and the updated definition of products, Thai product liability law will evolve for the digital era by protecting consumers from the harm caused by both traditional and digital products. This implies that software, digital files, or any service on online platforms will fall under the product liability framework.

7.2 Expansion of "Entrepreneur" to Digital Actors

This reformation is based on the current definition of an entrepreneur. Although this definition encompasses manufacturers, importers, sellers, and other parties, it does not provide an expanded definition related to AI. At this point, it may raise the question of whether 'economic operator' should be included in the definition of entrepreneur.

Economic Operator shall mean a manufacturer of a product or component, a provider of a related service, an authorised representative, an importer, a fulfilment service provider, or a distributor. This comes from Article 4 (15) of the new PLD.

The definition of "entrepreneur" may encompass nearly all participants in regular business, but for AI liability, it is essential to provide more specific terminology. This is why "economic operator" should be added as a new definition alongside "entrepreneur." With this additional definition, it will encompass various business actors in the AI sector regarding AI liability and allow the law to broaden the scope of liability for AI business operators.

It should be noted that in the future, new businesses related to the development of AI will emerge. These new enterprises may struggle to define the specific characteristics of the business and the individual who controls such a venture. In such cases, the vagueness of these definitions will hinder consumers from making claims regarding these activities. This is why adopting the definition of an economic operator will encompass all future businesses under this term and will also address legal gaps in the terminology of manufacturers.

7.3 Introduce the Rule on Disclosure of Evidence

This is an innovative provision that Thailand may utilise. Despite Thailand's continued implementation of the power for judges to reverse the burden of proof in consumer cases, the procurement of evidence remains permissible. The rationale is that

not all instances require companies to provide the necessary documentation demonstrating product safety, which leads to tension between manufacturers and consumers. Consequently, Article 9 of the Directive is operative. Thailand lacks specific regulations concerning the disclosure of evidence in civil law; therefore, it is reasonable for Thailand to adopt such provisions.

Generally, the evidence disclosure rule aligns with Article 173/2 of the Thai Criminal Procedure Code, which mandates that on the day of evidence examination, parties must present any documentary evidence still in their possession to the court for the opposing party's review. This provision is grounded in the principle of fairness within the criminal process. Similarly, Article 9 of the Directive also emphasises fairness among the parties. Although consumer cases are classified as civil, their characteristics are influenced by the evidence held by the other party. This regulation effectively serves justice. Under enterprise liability, the fundamental principle revolves around balancing the benefits for all parties involved. Thus, why not disclose evidence and clarify the technological facts relevant to the case?

7.4 Introduce Presumptions of Defect

Although Thailand must continue to uphold the judge's decision regarding who will bear the burden of proof, it is still appropriate to adopt the presumptions of defect and causation from the new PLD.

The cause of the defect, whether from manufacture, design, or failure to warn, remain significant to clarify, as the Thai legal system has adopted the notion of defects from the United States. Consequently, Thailand will adopt only certain precise assumptions.

The presumption of defectiveness is necessary because AI systems are complex, opaque, and autonomous. It is difficult to prove that products are defective. Thailand has already reversed the burden of proof; these presumptions of defect will increase the capacity to prove product defects. It is crucial to borrow the presumption of defectiveness in Article 7 of the new PLD, which should reference Article 7(2)(a) to (i). These pertain to the assumption of learning capacity, the anticipated impact on the product's usage, the point at which the product exited the manufacturer's control, applicable safety standards, any product recalls, the distinct requirements of the user demographic, and the failure to meet the duty to prevent harm.

The necessity of the presumption of defectiveness arises from the fact that AI products and services differ fundamentally from conventional products. Therefore, merely listing product characteristics at their market launch is inadequate. This presumption clarifies the specific circumstances surrounding certain products and services, enabling the court to assess their defectiveness. For instance, the regulations outline essential product characteristics, particularly those unique to AI, such as complexity, opacity, and autonomy. These aspects must be considered when determining a product's defectiveness by the court. Additionally, the capacity to learn is crucial, reflecting the nature of machine learning that can improve AI systems.

7.5 Introduce the Presumption of Causality

The borrowing presumption of causality serves to reverse the burden of proof. If there are any conditions mentioned by the law, the defectiveness of the product shall be presumed under Article 10 (2) to (5).

Why must Thailand uphold the judge's decision and adopt the presumption of defectiveness? The reason lies in the issue of 'subjective decision'. Thailand decides to reverse the burden of proof subjectively, depending on the specific case and the individual parties involved. Furthermore, different judges may hold varying perspectives. This does not contribute to ensuring fairness in society. Thus, implementing the presumption of defectiveness will provide robust provisions to support consumers' claims.

Especially under Article 10 (4), the rules regarding excessive difficulties will help to support claims of consumers in excessive cases. If manufacturers do not wish to bear the burden of proof, they should ensure that their knowledge of particular technologies is clear and more understandable for all parties in court. This will prevent manufacturers from using the excuse of disclosing confidential information.

7.6 Introduce Data Loss

To enhance legal support for AI technology, it makes sense to increase the damages linked to manufacturers' responsibilities. Currently, Thailand provides compensation for physical harm, mental distress, and punitive damages. However, an equally crucial aspect in AI is the compensation for data loss. Data represents a form of property, albeit an invisible one in the digital realm, and losing it can negatively affect consumers. Since all data can be sold or misappropriated, manufacturers are obligated

to safeguard personal data. At this point, it is logical to incorporate Article 6 from the Directive and further refine Thai product liability law.

7.7 Implement Development Risk Defence with Conditions

This matter is a significant concern that Thailand consistently neglects in the implementation of current product liability laws. Thailand ought to amend the product liability law by incorporating the development risk defence. It is located in Article 11(1)(e) of the new PLD. This provision grants an exemption based on the scientific and technical knowledge available at the time the product was marketed or utilised, or during the period the product was under the manufacturer's control, thereby rendering the defect undetectable.

According to the AI liability, Article 11(2)(a), (b), (c), and (d) delineate the exemptions for manufacturers from the development risk defence. Manufacturers shall remain liable for product defects arising from associated services, software, including updates or upgrades, insufficient software updates or upgrades essential for safety, and significant modifications to the product.

However, it would be more effective to adopt the limitation by integrating the constraint of the development risk defence in cases involving harm to human life or health.

Table 1

Summary Chart: Reform Proposals vs. Current Thai Law

Reform Area	Current Thai Law	Proposed Reform
Definition of Product	Tangible goods only; excludes software and digital services	Include software, AI systems, and digital services that cause harm
Scope of 'Entrepreneur'	Limited to manufacturers, importers, and sellers	Extend to economic operators, including AI developers
Presumption of Defect and Causation	Reverse the Burden of Proof by a judge, but no disclosure of evidence	Add more protection by disclosure of evidence Add presumption of defectiveness Add presumption of causality

Reform Area	Current Thai Law	Proposed Reform
Development Risk Defence	Not recognised	Introduce conditionally, excluding cases of bodily harm
Mental Harm and Data Loss	Recognised (mental harm); data loss not covered	Maintain recognition of mental harm; expand to data loss per EU standards

This table presents a comparison between the current law and the proposed reforms, which can serve as a brief guideline for recommendations.

8. Conclusion

In summary, the new PLD of the European Union aligns with the enterprise liability theory, striking a balance between the benefits for consumers and manufacturers. Additionally, it expands the scope of consumer protection laws concerning AI liability. Therefore, it is reasonable to expect that Thailand will amend its Unsafe Products Act to incorporate the new PLD.

Thailand can continue to rely on existing laws in various matters, particularly the principle of reversing the burden of proof by the judge, which remains a significant provision in Thai product liability law. Nonetheless, numerous factors justify reform in Thailand. The revisions include an expanded definition of entrepreneurs, a broader scope of the law encompassing services, and an extension of the product definition to include immovable property. It is advisable for Thailand to adopt the presumption of defectiveness and causation, implement the rule of evidence disclosure, and recognise the development risk defence. The proposed reforms are set to enhance the legal framework surrounding AI liability in Thailand.