The Impact of Trade Secrets on Innovation and Product Development in the Technology Industry

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Abstract

Trade secrets are information in the technology and/or business sectors that is not publicly known, has economic value, and is kept confidential by its owner. In the technology industry, trade secrets play a crucial role in driving innovation and product development. Protecting strategic information such as formulas, designs, algorithms, and production methods enables companies to maintain a competitive advantage amidst increasingly dynamic market competition. This study highlights the impact of trade secret protection on the sustainability of innovation and product development processes, while also emphasizing the importance of effective legal mechanisms to safeguard high-value information to drive sustainable growth in the technology industry.

I. INTRODUCTION

In the era of a knowledge-based and technology-based economy, information has become a strategic asset with high economic value. Technology companies are racing to create new innovations through research and development (R&D) to maintain their competitive edge in the highly competitive global market. Amidst this competition, the confidentiality of technical and business information is key to maintaining a competitive advantage. Trade secrets serve as a vital form of legal protection for technology industry players, protecting high-value information such as formulas, production methods, algorithms, designs, and marketing strategies.

Trade secrets are specifically regulated in Law Number 30 of 2000 concerning Trade Secrets, which grants the owner of the information exclusive rights to prevent others from using or disclosing it without permission. Unlike other intellectual property rights, such as patents or copyrights, trade secret protection is not limited by a specific time period as long as the owner is able to maintain its confidentiality. This characteristic provides a strategic advantage for companies, especially in the technology industry with its rapid innovation cycle, as companies do not need to disclose critical information to the public as required by patent registration.

These advantages are what encourage many inventors and industry players to choose trade secrets as the primary form of protection for their innovations. Maintaining confidentiality allows companies to feel more secure in continuing to invest in R&D, developing new products, and accelerating their market launches without the risk of losing economic benefits due to information leaks. Effective trade secret protection also plays a crucial role in maintaining technological advantages that are difficult for competitors to imitate, thus fostering a healthy and sustainable competitive climate.

However, the challenges of maintaining confidentiality cannot be ignored. The development of digital technology, including the ease of access and exchange of information, increases the risk of data leaks, industrial espionage, and trade secret breaches. Cases of strategic information leaks, whether through internal leaks, hacking, or forced takeovers, demonstrate that adequate legal protection must be accompanied by rigorous information security management. Therefore, a thorough understanding of the concept, scope, and mechanisms of trade secret protection is

increasingly important, especially for the technology industry, which relies heavily on the speed of innovation.

This research, driven by this urgency, aims to examine the impact of trade secret protection on innovation and product development in the technology sector. This study is expected to provide a scientific contribution in assessing the extent to which trade secrets can encourage R&D investment, strengthen business strategies, and create a conducive climate for the growth of the technology industry in Indonesia. By highlighting the role of trade secrets in the context of intellectual property law, this research is also expected to serve as a reference for policymakers, industry players, and academics in formulating policies and strategies that support the protection of strategic information while spurring sustainable innovation.

II. RESEARCH METHODS

This study employs qualitative research methods and a normative approach, focusing on analyzing the influence of trade secrets on current technological developments and the implications of relevant regulations. The data used is a literature review, obtained from various sources or related references, including journals and books. This method was used to obtain the research results, which were analyzed using descriptive qualitative methods.

III. RESULTS AND DISCUSSION

A. Basic Concepts of Trade Secrets

Trade secrets are specifically stipulated in Law Number 30 of 2000 concerning Trade Secrets, in Article 1 it is stated that Trade Secrets are information that is not known to the public in the field of technology and/or business, has economic value because it is useful in business activities and its confidentiality is maintained by the owner of the trade secret.

In Article 2 of Law No. 30 of 2000, that the Scope of trade secrets is The scope of trade secret protection includes production methods, processing methods, sales methods or other information in the field of technology and or business that has economic value and is not known to the general public (Muthiah, 2016: 165). The information must have economic value, be actual and potential, not publicly known and cannot be used by others who do not know the information in detail. This information must also be consistently kept confidential (with certain steps according to reasonable measures), so that it cannot be used by others, because with this information someone can gain a competitive advantage to compete with competitors who do not know the information.

Information in trade secrets is grouped into technology information and business information. Technology information includes:

1. Information about research and development of a technology.
2. Information about production/process c. Information about quality control.

Meanwhile, what is meant by business information is:

1. Information related to the sales and marketing of a product.
2. Information related to subscribers.
3. Information about finances.
4. Information about administration.

Trade secrets can be managed more flexibly because they are not bound by formal requirements, as is the case with the patent system, which requires compliance with formalities and an examination process, and trade secrets have an unlimited duration. Trade secrets are protected if the information:

1. It is confidential and is only known to certain parties, not the general public.
2. It has economic value if it can be used to carry out commercial activities or businesses or can increase economic profits.
3. Confidentiality is maintained if the owner or the parties controlling it have taken appropriate and proper steps.

It is not considered a trade secret violation if:

1. Disclosing in the interests of public defense, health, or safety.
2. Reverse engineering of a product resulting from the use of another person's trade secrets carried out solely for the purpose of further developing the product in question.

Anyone who intentionally and without the right uses and discloses Trade Secrets, breaks an agreement or breaks a written or unwritten obligation to protect the Trade Secret in question, or another party who obtains/controls the Trade Secret in a manner that is contrary to the applicable laws and regulations, shall be punished with imprisonment for a maximum of 2 (two) years and/or a maximum fine of Rp. 300,000,000.00 (three hundred million rupiah).

To obtain Trade Secret protection, registration is not necessary (it takes place automatically),

because the law directly protects the Trade Secret if the information is confidential, has economic value and is kept confidential, except for the Trade Secret license that is granted. The Trade Secret License must be registered with the Directorate General of Intellectual Property Rights - Ministry of Law and Human Rights (Isnaini, 2010: 97).

B. The Role of Trade Secrets in Technological Innovation

Trade secret protection plays a crucial role in safeguarding a company's research and development (R&D) results from theft and unauthorized use, as stipulated in Law No. 30 of 2000 concerning Trade Secrets. This protection increases investor confidence in R&D projects by reducing the risk of information leaks. Furthermore, trade secret protection facilitates collaboration between companies and research institutions in developing new technologies.

Companies have various motivations for protecting innovation through trade secrets. This protection provides assurance to strategic company assets, such as algorithms, technology, and customer data, which are at the core of competitive advantage (Katz & Shapiro, 1986; Porter, 1985). Furthermore, trade secrets also encourage companies to continuously develop innovations relevant to market needs and strengthen their position amidst industry competition.

Trade secret protection has a significant impact on the pace of innovation in the technology industry. By maintaining exclusivity over new technologies, trade secrets encourage companies to accelerate the innovation and development process (Cohen & Levinthal, 1990). This protection also contributes to economic development by increasing investment and creating new jobs. Furthermore, trade secrets help reduce dependence on foreign technology, thus supporting long-term technological independence.

C. The Influence of Trade Secrets on Product Development

Trade secrets play a crucial role in driving innovation and product development across various industrial sectors. By keeping strategic information such as formulas, production methods, or designs confidential, companies can protect their competitive advantage in the marketplace. Trade secrets allow companies to develop new products without the immediate risk of imitation by competitors. This protection of information allows companies to maximize the value of their innovations.

Furthermore, the existence of trade secrets can encourage investment in research and development (R&D). Because companies know their strategic information is protected, they are more likely to allocate resources to creating innovative products. For example, in the pharmaceutical industry, drug formulations are often protected as trade secrets throughout the development process until the product is patented or marketed. This ensures a significant return on investment for the company.

However, trade secrets can also hinder collective innovation. Due to their secretive nature, trade secrets can hinder the sharing of information that could accelerate technological progress across industries. For example, companies may be reluctant to share technology that could be used for mutual benefit if they feel it would weaken their market position. As a result, innovation often develops in silos, with each company focused on protecting its own intellectual assets.

On the other hand, trade secrets provide opportunities for more secure collaboration between companies. In strategic partnerships or business alliances, trade secrets can be licensed or shared with agreed-upon restrictions. With legal protection, companies can be more confident in sharing technology or critical information without the risk of misuse by partners. This is often the case in cross-industry product development, such as electric vehicle technology involving battery and automotive manufacturers.

Overall, trade secrets have a complex impact on product development. On the one hand, they foster innovation by protecting a company's R&D output, while on the other, they can limit broader collaboration. To maximize their benefits, a balance is needed between protecting trade secrets and creating a collaborative innovation ecosystem, so that the entire sector can continue to develop sustainably.

D. Challenges and Risks of Trade Secret Protection

Challenges and risks in protecting trade secrets in business collaborations generally include data breaches, weak regulations, and technological risks in the form of threats of hacker attacks and the use of insecure software increasing the risk of data leaks.

When collaborating within a company, trade secrets can be compromised if confidential information is shared without proper security measures. This puts the company at risk of financial and reputational damage. Cases like UD Mebel Lindah demonstrate the negative impact employee information leaks can have, leading to customer complaints and financial losses.

Trade secret leaks in business partnerships can also occur due to various factors, such as the disclosure of confidential information. When a company shares confidential information, the risk of leaks increases, especially if strong confidentiality protections are not in place. Furthermore, employee misconduct, as has occurred in several cases, can lead to former employees or third parties disclosing information to gain a competitive advantage. Cultural incompatibilities, such as differences in values and cultures between partners, can lead to conflicts that undermine cooperation and increase the risk of information leaks.

Clear confidentiality agreements and information security strategies are essential for protecting trade secrets. To protect trade secrets, companies must implement confidentiality agreements and information protection policies. Too much collaboration can also increase the risk of information leakage. Therefore, it is important to maintain balance in business partnerships.

Disruptive technologies can also pose significant challenges to trade secret protection. A clear example is ride-hailing apps like Go-Jek and Grab, which have disrupted the taxi industry. However, these advancements also pose threats to trade secret protection. When companies collaborate and share data, they increase the risk of confidential information being leaked, potentially damaging their competitive position. Digital transformation increases the risk of data leaks due to uncontrolled disclosure and reduces the effectiveness of existing legal protections, as stipulated in Law No. 30 of 2000. Furthermore, the use of digital media can lead to the dissemination of sensitive information, which can endanger its owners if not properly secured. To address the new challenges of the digital era, reforming trade secret protection mechanisms is necessary.

Legal regulation in the digital era also poses significant challenges, particularly in the areas of data protection, cybersecurity, and e-commerce. Indonesia's Electronic Information and Transactions Law (UU ITE) plays a crucial role in regulating digital transactions and protecting consumers, but its implementation remains flawed. Key obstacles include disparate technological infrastructure, low public awareness of the law, and the need for cross-border regulatory harmonization to address emerging complex issues. Building a responsive legal ecosystem requires adaptive legal reform and collaboration between government, businesses, and civil society.

Implementation constraints are also a common challenge for trade secrets in this digital era. These implementation constraints include the numerous technology-related regulations scattered across various laws, making them difficult to understand and apply consistently; the lack of harmonization between traditional and digital laws, and the lack of coordination between the government, law enforcement agencies, and online business platforms; technology-related laws do not fit within a common framework, making it difficult to provide a comprehensive understanding of digital law to the public; and cyber threats and the misuse of digital business activities that can cause losses continue to be major challenges in protecting companies in the digital era. To overcome these obstacles, an integrated and adaptive digital law design is needed, along with an effective digital literacy program to increase citizens' legal awareness.

Another issue is that legal battles to protect creative works and innovation can be expensive and time-consuming. High litigation costs can be a barrier for creators and innovators seeking to defend their intellectual property rights. In some cases, ethical questions surround intellectual property rights, particularly in the context of access to essential medicines, technologies needed to address environmental issues, or access to knowledge in education.

Therefore, legal adjustments to new developments are necessary. Intellectual property rights law must be continually adjusted to reflect new developments in technology, economics, and culture. This requires regulatory and policy updates to ensure effective protection for creative and innovative works (Suhaeruddin, 2024).

E. The Influence of Trade Secret Law Policy on Technological Development in the Global Market

Initially, the Trade Secret Law was created with the aim of advancing industries that are able

to compete in the national and international trade sphere by providing legal protection for trade secrets and being able to prevent unfair business competition among business people who have trade secrets as their intellectual property.

At the federal level in the United States, the Economic Espionage Act (EEA) was passed by Congress and signed into law in 1996. The EEA created two criminal offenses to protect trade secrets. In 2016, the EEA was amended by the Defend Trade Secrets Act (DTSA). The DTSA added civil liability, expanding access for trade secret owners to federal courts in civil cases. Under the Uniform Trade Secrets Act ("UTSA"), a trade secret is defined as information that has independent economic value because it is not generally known or readily ascertainable, and is subject to an effort to maintain secrecy. Unlike copyrights, patents, and trademarks, trade secrets are not registered with a government agency.

The international definition of trade secrets has been integrated into the requirements of TRIPS. Member countries must protect trade secrets, or "confidential information," that has commercial value because it is confidential and has taken reasonable steps to keep it confidential. Such information must be protected from disclosure, acquisition, or use by others in a manner contrary to fair commercial practices. TRIPS does not prescribe a specific method for protecting trade secrets; in practice, member countries have their own stand-alone trade secret laws, incorporate trade secret protection into their unfair competition laws or contracts, and/or rely on common law.

Trade secret protection according to Article 2 of the Trade Secret Law covers various methods, namely from the method used for production, processing methods, methods in conducting sales, or other information that has economic value in the field of technology and/or business, where the information has the criteria of being unknown to the general public. Based on the provisions of Article 2 of the Trade Secret Law, activities in the food industry, both in the form of food and beverage products, are information in the business field that has economic value that is known only to the owner. Therefore, the results of the food industry are protected by trade secrets.

The development of global trade has implications for the food industry, which is experiencing increasing growth. Various types of food and beverages are sold both directly and through online ordering. Products processed in the food industry have their own distinctive flavors, created using specific recipes. Recipes are created by their owners through valuable ideas, which constitute intellectual property rights. Recipes in the food industry are a trade secret of their owners or holders. Some examples of food industries protected by trade secrets include Coca-Cola, Pizza Hut, KFC, and others.

F. Alternative Protection for Technological Innovation

Modern industry offers a variety of intellectual property protection options designed to safeguard valuable assets, including confidential information, innovations, and creative works. One such protection is trade secrets, which protect commercially valuable information such as recipes, formulas, or production methods indefinitely, as long as the information remains confidential. Patents, on the other hand, protect new inventions such as products, processes, or methods for 20 years but require disclosure. Copyright protects literary, artistic, musical, and software works for 50–70 years, while industrial designs protect a product's shape, configuration, or color for 10 years. Trademark protection protects the name, logo, or symbol that identifies a product or service for 10 years and can be renewed.

Each form of protection has unique characteristics related to duration, cost, and transparency. Trade secrets have no time limit, are low-cost, and offer closed protection. In contrast, patents provide 20 years of protection, but are expensive and open-ended. Copyright, industrial designs, and trademarks offer varying protection periods, but at a more affordable cost and provide open information. Therefore, the choice of protection depends on the specific needs of a company or individual.

To select the right protection, several strategic factors need to be considered. The purpose of the protection must first be determined, whether it is to protect inventions, creative works, or confidential information. The duration of the protection and the required costs are also important aspects, especially for companies with limited budgets. Furthermore, the level of information disclosure and the risk of intellectual property rights infringement must be thoroughly analyzed to ensure an optimal protection strategy.

When safeguarding trade secrets, information security technology can be used as an additional layer of protection. For example, encryption can

protect confidential data by securing information with codes, while firewalls and authentication systems help restrict access and ensure the identity of authorized users. The use of non-disclosure agreements (NDAs) and access controls are also important strategies for reducing the risk of information leaks.

In addition to conventional methods, licensing and technology exchange can be used as alternative protection. Licensing allows others to use intellectual property rights under certain conditions, while technology exchange creates opportunities for collaboration and shared benefits. Additional considerations such as dependence on specific technologies, potential infringement, and their impact on business strategy need to be evaluated to ensure the protection chosen supports sustainable business growth.

IV. CONCLUSION AND SUGGESTIONS

A. Conclusion

Trade secrets are information that is not publicly known, has economic value, and is kept confidential, as regulated in Law No. 30 of 2000. Trade secret protection covers information in the field of technology, such as production methods, research, and quality control, as well as in the field of business, such as marketing, finance, and customer data. Trade secrets provide flexibility in protecting a company's strategic assets without requiring formalities such as registration, provided that the information remains confidential and has economic value. This protection plays a vital role in driving innovation, accelerating technological development, and creating a company's competitive advantage in the market.

Trade secrets play a crucial role in driving innovation and product development in the technology industry. This protection safeguards strategic information, such as algorithms, production methods, and customer data, which are at the heart of a company's competitive advantage. By maintaining the confidentiality of information, companies can maximize the economic value of their innovations without the risk of imitation by competitors. Furthermore, trade secret protection motivates investment in research and development (R&D), accelerates the innovation process, and strengthens a company's market position amidst global competition.

B. Suggestion

First, the government needs to strengthen trade secret protection mechanisms through more effective oversight and law enforcement. This includes updating regulations to align with developments in digital technology, including specific provisions regarding data security and preventing industrial espionage. Intensive outreach is also crucial to increase understanding among business actors, researchers, and the public regarding the provisions of Law No. 30 of 2000 and procedures for protecting trade secrets.

Second, technology companies are advised to establish a comprehensive information security management system. This includes implementing internal confidentiality protocols, non-disclosure agreements (NDAs) with employees and business partners, and utilizing cutting-edge cybersecurity technology. These efforts will ensure that high-value information, such as algorithms, customer data, and production methods, remains protected from leaks and unauthorized access.

Third, higher education institutions and research centers need to strengthen their curriculum and training related to intellectual property rights, particularly trade secrets. Increasing the capacity of academics and legal practitioners in this area will encourage the development of human resources capable of understanding, managing, and protecting strategic information professionally.

Fourth, industry players are expected to be more proactive in registering other intellectual property assets that complement trade secrets, such as patents or copyrights, to create more comprehensive protection. The synergy between trade secret protection and other forms of intellectual property rights will strengthen companies' competitiveness in the face of global competition.

Finally, further research is needed to quantitatively explore the relationship between trade secret protection, R&D investment, and corporate economic performance. Such research findings will provide a stronger empirical basis for developing public policies and business strategies oriented toward sustainable innovation.

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