Intellectual property management for SMEs

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Abstract. As a fundamental element of the knowledge economy, intellectual property is widely used in the modern management of companies. Awareness of the fact that, as a carrier of knowledge intellectual property can become a competitive advantage, requires enterprises to synchronize their management strategy with their intellectual property management strategy. This is difficult for small and medium-sized enterprises (SMEs) that are just entering the competitive market. Realizing the role of intellectual property as a strategic asset, the opportunity for SMEs to generate maximum economic benefits from the management of intellectual property rights increases, which becomes a means of development and a means of creating value. The present study is aimed at revealing strategies for choosing a regime for the protection of intellectual property of SMEs. In this regard, the concept of intellectual property management is clarified, the stages of intellectual property management are presented and the need to develop an intellectual property management strategy is justified, as well as the implementation of this strategy in the overall management and development strategy of the company. The prerequisites for developing a strategy for choosing a mechanism for the protection of the objects of intellectual property owned by SMEs are outlined. In conclusion, the difficulties faced by small and medium-sized enterprises related to the intellectual property system are outlined.

Keywords: Knowledge economy, Intellectual property, Strategic management, Intellectual property management, Mechanism for protection, SMEs

1. Introduction

The products of man's intellectual work have determined the development of society for centuries. Their role as an innovation engine in modern times brings intellectual property as a major factor influencing the economic growth of the entire economy. This is particularly important in the context of the knowledge economy, according to which long-term growth depends on the economy's ability to innovate and turn knowledge into an economic result. (Albach & Rosenkranz, 1995; Towse & Holzhauer, 2002 Bechtold, 2007; Chobanova, 2007, Cheung, Wang, Tse, & Ma, 2013, Kyazim 2019).

The transformation of knowledge into an economic result through intellectual property becomes possible in cases where the necessary protection of intellectual products is provided, which predetermines the essence of intellectual property as a legal category. Intellectual products as objects and the legal and economic relations arising between them form the system of intellectual property. In this regard, the World Intellectual Property Organization defines intellectual property as "creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce." (WIPO, 2020). Intellectual property objects receive protection through several legal acts (at international, regional, and national level) when their nature meets the conditions set out in the respective act.

The composition of intellectual property is determined according to the individual areas of human creativity and development. Source of intellectual outputs are both creative industries, whose research activities in the field of industry (pharmaceutical, chemical, food), automotive, biotechnology creates innovative developments, as well as cultural industries creating in software, publishing, music, film, etc. areas. Individual objects of intellectual property in this sense include inventions, utility models, trademarks, designs, geographical indications (industrial property), works in the field of science, literature, and art (artistic property), new objects of intellectual property, arising from innovative developments in the field of information, digital, telecommunication technologies, biotechnology and artificial intelligence and any subsequent achievements of the human ingenuity.

The emphasized peculiarities of intellectual property make it the center of modern theory and practice in the field of management of both powerful companies and SMEs. "Intellectual property is a key concern in the quest for growth, development and competitiveness." (UNECE, 2011, p.1). Intellectual property is becoming a source of competitiveness for companies, an attraction for consumers, an engine for the economy. In this context, effective intellectual property management is key to sustainable development.

The aim of the paper is to reveal strategies for choosing a regime for the protection of intellectual property of SMEs. Empirical and theoretical methods (research, synthesis, and analysis) are used to achieve this goal, which clarify the role of intellectual property management strategies in the formation of a strategic business asset. Based on an overview of the existing literature in the field of intellectual property management, the importance of integrating the intellectual property management strategy into the overall development strategy and management of the company. The prerequisites for developing a strategy for choosing a mechanism for the protection of the objects of intellectual property owned by SMEs are outlined. In conclusion, the difficulties faced by small and medium-sized enterprises related to the intellectual property system are outlined.

Theoretically, the proposed research enriches the existing specialized literature in the field of intellectual property management and emphasizes the importance of developing a strategy for choosing an intellectual property protection regime for SMEs. The managerial importance of the study is to support SME managers by providing them with information on the possibilities of providing protection for the intellectual products owned, and to provide a starting point for choosing a specific strategy of protection for intellectual property.

The significance and originality of the study is expressed in the systematization of the existing knowledge about the management of intellectual property and the strategies for protecting the intellectual products of SMEs and offering assorted opportunities not only to provide protection of intellectual property, but also to extend the period in which SMEs can derive economic benefits from it. The importance of implementing an SME-friendly strategy for the protection of intellectual property as a decisive factor for increasing competitiveness is outlined.

2. Intellectual Property Management

The management of intellectual property as a concept has been the subject of research by several authors (Bader, 2006; Cheung et al., 2013; Fisher & Oberholzer-Gee, 2013; Maneva, 2017; Holgersson, & Santen, 2018; Borisova, 2018, Baran and Zhumabaeva, 2018; Kyazim, 2019, 2020; Grzegorczyk, 2020; Nikolova-Minkova, 2021a). In their study, Holgersson, & Santen (2018) found that over the period 1980-2014, the number of publications in the field of intellectual property management has increased steadily, with a significant part of the research focused on the need to integrate intellectual property management into the overall management strategy of the company. (Teece, 2010; Somaya, 2012; Al-Aali and Teece, 2013; Cesaroni and Piccaluga, 2013; Granstrand and Holgersson, 2013). The cited research emphasizes the role of management in achieving economic benefits to the company from owning intellectual property.

Research examining the role of intellectual property for SMEs is also a significant place in the specialized literature (Kitching & Blackburn, 1998; Burrone, 2005; Conley, 2009; Eppinger, and Vladova, 2013; Sukarmidjan & Sapong, 2014; Baran and Zhumabayeva, 2018; Disemadi, 2022; Lu, & Qi, 2022; Yu, Li, & Mahendran, 2023), which makes it necessary to look more closely at intellectual property as a driver or obstacle to SMEs development.

Kyazim (2019) acknowledges that intellectual property ownership alone does not guarantee companies economic development and does not create value. Effective management of intellectual property rights is necessary to demonstrate the functions of intellectual property objects to create value. Effective intellectual property management defines its role in creating wealth and well-being (Gargate & Momaya, 2018).

The essence of intellectual property management, according to Borisova (2018), is expressed in:

- disclosure of intellectual property within the Company and their management, by providing the necessary protection and subsequent use to generate economic benefits.
- pursuit the powers in the composition of intellectual property rights for the purpose of economic realization of intellectual property objects.

The management of intellectual property as a process goes through various stages (see Figure 1).



Figure 1: Stages in the intellectual property management process



A significant problem for SMEs is the ability to *correctly identify* the intellectual outputs existing within the enterprise. The inability to reveal the essence of an intellectual product as an object of intellectual property can lead to economic losses from unrealized opportunities for exploitation of intellectual property rights.

The valuation of intellectual property is intended to determine the financial expression of the objects as comprised. The measurement of intellectual property as an intangible asset is determined according to the nature of the object itself and the information that the assessor collects, interprets, and uses. This requires consideration of all considerations relating to the asset (Kyazim, 2022) among which:

- The context of the situation in which the valuation is made it is not irrelevant whether the valuation is conducted in connection with the forthcoming sale of the asset or its licensing, whether the object has legal protection provided, etc.
- The stage of the life cycle of the object of intellectual property from the birth of the idea of innovation development to its final realization, the development of the intellectual product goes through various stages of creativity, creation and implementation of the idea, exploitation, and obsolescence, which affect the value of the object of intellectual property.

- The presence/absence of protection the presence or absence of protection for the innovation development determines the accessibility of stakeholders other than the owner to the object of intellectual property and is related to its value.
- The obsolescence of the asset it is related to the development of innovative technologies that displace the already protected and known analogous technologies. Obsolescence leads to a sharp change in the value of the asset and to the need to develop innovative technologies.

Protection over intellectual property objects can be implemented through legal mechanisms to ensure protection in accordance with the existing legislation in the field of each of the objects of intellectual property and by keeping the information about the object of intellectual property confidential, with the introduction of the necessary measures. The absence of any means of protection makes the asset freely accessible to all interested parties, which deprives the owner company of the opportunity to derive economic benefits from its possession and reduces its competitiveness. This again proves the importance of the first stage of intellectual property management in identifying intellectual property objects within SMEs.

The exploitation of the object of intellectual property is related to the monopoly rights granted to the owner of the object through the introduction of a certain protection regime. By virtue of regulations, the owner of intellectual property receives the right to use the intellectual property and to derive all economic benefits arising from such use or to decide to whom to grant the right of use.

The defend of intellectual property is again related to the rights arising from the provision of a mechanism for the protection of objects. The owner of property rights has the right to prohibit third parties from using his intellectual product without his explicit consent and only he provides the subject of intellectual property for use by third parties upon conclusion of a contract (license agreement) and against payment of the appropriate remuneration (license fees). By the reason for the protection of intellectual property its owner can choose different strategies to apply.

The reviewed stages of intellectual property management show that management is a kind of process of monitoring the objects in the intellectual property portfolio in a company. It is not a one-time act, but a continuous process, the beginning of which is set with the birth of the idea of innovation development, passes through its creation and implementation in a product, the subsequent protection, commercialization, and achievement of economic result, to moral obsolescence and displacement by a new intellectual product. All the above, as well as the monitoring of competitors' intellectual property as part of business intelligence, falls within the scope of intellectual property management (Gassmann and Bader, 2007), and the quality with which the listed activities are performed determines the effectiveness of management.

One of the most widely applied typologies to categorise existing management approaches and identify opportunities for development and economic gain from intellectual property ownership for stakeholders is that of Davis and Harrison (2001). It represents a hierarchy of intellectual property management at five levels, starting at the base of the pyramid (see Figure 2).



Figure 2: Intellectual Property Management Pyramid

Levels in the hierarchy of intellectual property management follow in importance, ranging from the defensive level to the visionary level. Sullivan and Harrison (2008) stress that not always the highest level is best suited to a specific firm, as the needs and capacities of companies need to be considered.

Maximizing economic outputs from the ownership and management of intellectual property rights requires the development of a management strategy based on an interdisciplinary approach, involving participants from all departments of the company, which will contribute to raising awareness of IP teams and at the same time increase the effectiveness of management by presenting the different perspectives of the participants, concerning research and development, marketing, sales, etc. (Berman, 2009; Cronin and DiGiammarino, 2009).

An essential point in the process of managing both intellectual property and the entire company is to provide the opportunity to maximize the time in which the company can derive economic benefits from its property. This is possible with the effective development and implementation of an intellectual property management strategy, which must be integrated into the overall management strategy of the company. In this regard, Tietze, Phaal, Bluemel & Wang point out that "*IP strategies specifically support objectives to maximise value creation and value capture, and thus support the overall goal of competitive advantage within business and corporate strategies"* (Tietze et al., 2020, p. 9).

3. Intellectual Property Management Strategies

By their nature, strategies are concepts purposefully developed to achieve prosperity and determine the direction of business development (Babadzhanov, 2016). Company development strategies should be built based on the company's available capabilities and resources, the goals set for it and the desired direction for development (Nikolova-Minkova, 2023). This requires considering all assets that will increase the competitiveness of the company and positively affect the results of its activities. Such a source of competitive advantage in modern times is intellectual property.

Awareness of the importance of intellectual property and its role in the development of companies is the first step in the effective management of SMEs. The second step is aimed at 5

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developing a strategy to achieve efficiency in the management of intellectual property and to derive the economic benefits that rights management can engender. According to Sullivan and Raley "an IP strategy is the collective set of decisions an organization makes regarding the actions, positioning and capabilities it seeks to achieve with its intellectual property in order to support its long-term business objectives" (Sullivan and Raley, 2010, p.36). The third step is awareness of the need to implement the intellectual property management strategy in the overall development strategy (Reitzig, 2007; Carson, 2008; Lynskey, 2009; Fisher, & Oberholzer-Gee, 2013; Tanaka, 2013; Holgersson, Granstrand, & Bogers, 2018; Kyazim, 2019; Nikolova-Minkova, 2023). On the one hand, combining the individual strategies of the functional units of the companies in the overall management strategy of the company, it is possible to synchronize the goals of these departments in the overall management of the company, and on the other hand, the management strategies of the different departments also put their mark on the management of intellectual property (see Figure 3).

As it becomes clear, the influence on the strategy of intellectual property management is conducted not only on the part of the strategies of the other departments in the company and the opportunities available for creating innovations, but also on the part of competitors and their innovation capacity. In addition to the above, Bittner (2010, p. 1) stresses the need to analyse "the IP position of major competitors, the existing prior art in the innovation fields and possible standards being relevant to the firm's innovations" (Bittner, 2010, p. 1)



Figure 3: Strategic Framework for Intellectual Property Management

Source: Bittner (2010, crp. 2)

This will contribute to avoiding infringements of intellectual property rights of third parties and to maximising the benefits of using intellectual property for business development and increase the competitiveness of SMEs (see Figure 4).



Figure 4: Steps to Achieve Effective Intellectual Property Management

Source: adapted to Kyazim (2019, p. 67)

Several authors (Blind et al., 2006; Cohen et al., 2000; Lichtenthaler, 2008) point out that the choice of a specific strategy by companies depends on the industry in which the company operates, the size of the company and the business model applied, the dynamics of the market, etc. The strategic management of the company and the intellectual property require determining the most effective strategy, considering all the influencing factors, with a different result of the implementation of the strategy being possible depending on the specific conditions at a given time.

The development of the intellectual property management strategy requires that when going through its individual stages (Tietze, Phaal, Bluemel, et al., 2022) various aspects influencing the effectiveness of management be considered (see Table 1).

Stage	Aspects			
Definition of	Providing protection for the company's innovative developments from			
objectives	the actions of unscrupulous competitors			
	- Achieving economic benefit through enforcement of intellectual			
	property rights			
	- Creating a barrier to competitors from entering the market			
	- Cooperation between companies			
	- Capturing the value created within the company			
Multiple objects	objects - Choice between own developments or acquisition of rights in othe			
of intellectual	people's developments.			
property	- Choosing an appropriate protection regime.			
	- Choice of a combination of rights to different subject-matter to extend			
	protection.			
	- Advantages and disadvantages of individual types of protection			
IP management	Rights – acquisition of IP objects / maintenance of protection regime			
strategy areas	Licensing - granting of rights to third parties against payment of			
	license fees.			

Table 1: Aspects influencing the effectiveness of IP management strategies.

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	 enforcement – safeguarding IP rights through lawsuits against violators or through compulsion to sign licensing contracts
Alignment	 The IP management strategy must consider the availability of different intellectual property objects. The IP management strategy must be consistent with the company's overall strategy. The IP management strategy must be consistent with strategic levels in organizations and the corporate, business, and functional strategy developed

Source: complied by Nikolova-Minkova (2023)

It has been pointed out so far underlines the importance of intellectual property management, which is especially true for small and medium-sized enterprises. Competing with powerful companies on the market, SMEs must use every opportunity to generate a competitive advantage, preventing the loss of positions due to inefficient management of their intellectual property, while at the same time having a limited budget.

Eppinger and Vladova (2013) conclude that "*SME do not require professional IP strategies and management practices, depending on their size and the market dynamics within their business environment.*" (Eppinger and Vladova, 2013, p. 78). This reflects the specificity of the activities of SMEs, whose innovative capacity and ability to create innovative goods, processes and services depends both on the sector in which they operate and on the size, resource at their disposal and the environment in which they operate (Burrone, 2005). While we agree with what Eppinger and Vladova (2013) said that not all SMEs need a professional intellectual property management strategy, we cannot agree that they do not need any strategy. The fact that SMEs represent 99% of companies in the European Union (Europa Parliament, 2023) and 90% of all companies in the world (World Bank, 2023) raises the question of the effective management of intellectual property located within SMEs. It is necessary to correctly identify intellectual outputs in protected SMEs and subsequently provide a safeguard mechanism that will contribute to maximising economic benefits from owned intellectual property objects. This justifies the need to consider strategies for choosing a regime for the protection of intellectual property of SMEs.

4. Strategies for the protection of intellectual property

After the correct identification of the objects of intellectual property within the SME and considering the advantages and limitations characteristic of each object, it is necessary to proceed with the choice of a strategy for providing protection. The choice of appropriate protection allows the use of the maximum potential of intellectual property to generate funds and create a competitive advantage for its owner.

Kyazim (2022) points out that the choice of protection regime must consider the following specific factors:

- Characteristics and features of the object each object of intellectual property is protected according to a specific normative act of national and international legislation in the field, which is the main one. Along with this protection regime, additional regimes to strengthen protection may be applied.
- The multi-element of protection it concerns the possibility of applying several different protection regimes in parallel to a single intellectual property object.

- the goods and services in which intellectual property will be implemented the safeguard regime considers the economic objectives pursued by SMEs, the strategy for the protection of intellectual property and its synchronization with the development strategies of the other units or the whole enterprise (see Figure 3)
- the objectives of the company according to the result that the SME seeks to achieve and the actions necessary to achieve a result, a specific regime of intellectual property protection or a combination of individual regimes applies.

Considering all these factors (Kyazim, 2022), SMEs need to build the framework of the strategy for the protection of intellectual property, which will support their development and increase their competitiveness.

Selvakumar (2022) examines two regimes (strategies) of intellectual property protection – the IP Atom Framework and the IP Continuum Framework. Each of these strategies offers a different combination of intellectual property rights, depending on the time, the characteristics of the object of intellectual property and the validity of other intellectual property rights.

The IP Atom Framework is a strategy in which different protection regimes apply to the same object of intellectual property, which overlap in their operation. Like the composition of the atom, IP Atom also has three layers (see Figure 5).



Figure 5: IP Atom Framework

Source: Montillot, N. (2023, 14 July, p.13).

At the heart of this atom strategy are placed the strongest and most stable protection regimes (patents and trade secrets). They are used for products providing functional utility for users through a new solution to an existing problem (Kyazim, 2022; Selvakumar, 2022). The second layer of the atom is occupied by the means of expression by which the intellectual output is presented to the users (advertising etc.) and for which copyright provides extensive protection. The outer final layer of the atom is assigned to the identity of the asset, which is represented by the trademark and design.

The IP Atom Framework presents the methods and skills for intellectual property management, applied to overlap different rights to obtain maximum protection. The fact that patent protection is limited in time (most often 20 years from the date of filing of a patent application) necessitates the use of other protection regimes, the effect of which will continue part of the rights even after the expiration of patent protection.

The second protection regime – IP Continuum Framework – Is based on the life cycle of the protection provided through the various regulations. The protection of intellectual property according to this regime is developed over time (see Figure 6), starting from the

most stable protection regime (patent), since the object has the greatest functionality at the beginning of its life cycle. In the period of patent protection reduces the wide protection of the functionality of the innovative product, therefore moving towards less functional forms of protection.

It is possible for elements subject to patent protection to be used protection under the copyright law (for drawings and schemes, descriptions for the creation of the subject-matter, etc., part of the patent documentation), which prolongs the useful life of the object of protection. As a next step in ensuring protection of intellectual property, the advantages of the trademark and design as forms of protection are switched. The unlimited in time legal protection that can be provided by registering a trademark for the subject matter of intellectual property provides the owners of the object of protection with additional economic benefits. Turning the trademark into a powerful brand (Nikolova-Minkova, 2021b) through which to influence consumer preferences and the commercial reputation of SMEs can contribute not only to the formation of consumer loyalty, but also to the maximum economic benefits through the accumulation of various protection rights.



Figure 6: IP Continuum Framework

The links between the life cycle of the object and its functionality (Figure 6) illustrate how by accumulating different rights (patents, copyright, and trademarks) a sustainable competitive advantage can be built (Conley & Szobocsan, 2001). The consistency in introducing different legal regimes for the protection of intellectual property allows innovative developments of SMEs, initially protected by patent or as a trade secret and presented to the public by various means of expression, protected by copyright and related rights legislation, to obtain virtually unlimited protection granted by trademarks, which will lead to the preservation of competitive advantage through effective management of intellectual property through the accumulation of various forms of protection.

An essential point in the cumulative strategy of protection is the manifestation of the value transfer principle (Conley & Szobocsan, 2001; Conley, 2009). The value of each added element of the cumulative strategy affects the total economic value received by the owner of the intellectual product protected by a patent or trade secret. The accumulation of protection for the extension of the rights to the patented invention through copyright and the registration of a trademark, as well as the subsequent influence of the means of expression used for the development of the brand in a brand and for increasing the value of the brand in the consumer consciousness can increase the value of assets many times. A similar example of intellectual property rights management is presented by Conley & Szobocsan (2001), who presented the 10

Source: Conley, J. (2023, 14 July, p.11).

trademark management strategy of Searle company. Receiving a US patent for the low-calorie artificial sweetener "aspartame", the company registered the brand Nutrasweet denote its use in foods and beverages as a sugar substitute. By creating in the consumer consciousness the connection between the patented product and the products marked with the Nutrasweet logo, the company builds the value of the brand and uses it to attract consumers. Thus, the licenses for the brand provided by the company to several manufacturers in the food industry bring it profits significantly exceeding the number of profits associated with the economic life of the patent (see Figure 7).



Source: Conley & Szobocsan (2001, p. 4)

The proposed protection regimes – IP Atom Framework and IP Continuum Framework bring out different opportunities for SMEs to acquire and maintain a competitive advantage, by virtue of the management of the intellectual property rights they own. The choice between the implementation of one or another strategy remains in the hands of SMEs and depends entirely on the objectives and strategy set for them. development.

It is also necessary to point out that in cases where SMEs do not have the financial capacity to provide legal protection of intellectual property owned, they must also be familiar with other practices and mechanisms of protection, as well as the results of their implementation (see Figure 8).

Type of practice	'Do nothing'	'Informal protection practices'	'Non-registrable legal rights'	'Registrable intellectual property rights'
Examples	No conscious strategy to protect intellectual property	Develop high trust relations with customers, suppliers & employees Maintain lead time advantage over competitors Build specialist know-how into products Member/user of an organisation which seeks to protect intellectual property	Confidentiality clauses & restrictive covenants in customer, supplier & employment contracts Prominent copyright notices Licensing	Patents Registered design Registered trade & service marks
		Increasing legal formality	>	

Figure 8: A continuum of intellectual property protection practices

Source: Kitching, & Blackburn (1998, p. 329).

Irrespective of the choice of SMEs to apply a specific protection regime from the options presented above, that choice must be justified as precisely as possible, considering the characteristics of the intellectual property objects held by the SME, its long-term objectives and the advantages afforded by one or another protection regime.

5. Conclusion

This paper examines the nature of intellectual property and the aspects of governance generated by its importance in modern times. The stages in the process of intellectual asset management are presented, as well as the specific features of intellectual property management strategies and aspects influencing their effectiveness. Emphasis is placed precisely on the strategies are the protection of intellectual property as a fundamental moment for SMEs to generate competitive advantage.

In conclusion, the difficulties faced by SMEs in the use of the intellectual property system should also be noted so far. First, there is the question of the awareness of the government on the issues of intellectual outputs and in particular the place of intellectual property in their business. Ambiguity regarding the advantages of correctly identifying intellectual property objects and the subsequent management of intellectual property rights can cause losses for the business of SMEs and inability to compete with other market participants.

On the other hand, this ambiguity about the role of intellectual property for businesses and the relevance of intellectual assets to the SME development strategy may discourage managers from investing in costly procedures to provide legal protection for their innovative developments.

Another problem emerges as regards the length of procedures for acquiring legal protection. Burrone (2005) stresses that in some intellectual property offices, where there is a concentration of intellectual property rights, the process of examining the requested objects is slower, which is an obstacle for SMEs, as it directly affects the possibility of applying the rights to innovative developments and reaping the economic benefits from their use.

Achieving broad protection of intellectual property (and territories outside the country of the owner of rights) requires knowledge of international law in the field of intellectual property and financial ability to maintain legal protection over foreign territories.

Not without significance for the realization of a positive economic result from the use of the system of intellectual property is the application of rights to the objects in its composition. Potential problems for SMEs here are associated with tracing the undertaking's bad faith use of intellectual property rights and the subsequent prosecution of offenders.

Without claiming that the existing problems and challenges facing SMEs in the use of the intellectual property system are comprehensively presented, it can be summarized that the main problem facing SMEs, in which all the difficulties addressed so far (and to some extent not presented) are implemented, is weak management. The lack of intellectual property management skills reduces the ability of enterprises to derive economic benefits from the intellectual property system, which is also an obstacle discouraging the future use of the system (Sukarmijan & Sapong, 2014). At the same time, the intellectual assets of SMEs on which there is no established protection regime can be used by competitors to generate economic benefits at the expense of the asset owner. Therefore, the policy of WIPO, EPO and other regional and national intellectual property offices implemented in recent years to provide comprehensive assistance to SMEs in the process of managing their intellectual property can contribute to removing the existing barriers for SMEs in the use of the intellectual property system and to stimulate the development of their innovation potential.

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