

FUNCTIONAL MANAGEMENT OF INTELLECTUAL PROPERTY OF INDUSTRIAL ENTERPRISES: ORGANIZATIONAL AND METHODOLOGICAL ASPECT

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Abstract

The article deals with the organization of functional management of intellectual property of industrial enterprises, since under conditions of insufficient funding of activities intangible assets can increase the market value of an enterprise, improve its financial condition and image. A comparative analysis of the use of intangible assets of Ukrainian, European and US companies has been held. It has been established that Ukrainian enterprises use only one intangible asset, i.e. software rights, which does not encourage the use of these assets.

The article proposes a methodological approach to the organization and implementation of intellectual property functional management, allowing: to join enterprises using goodwill and geological information; to sell fuel and energy resources of own production facilities based on the certificate of origin; environmental permits, which set the maximum allowable concentrations of pollutants; operating permits for the production and maintenance of imported coal.

Keywords: intellectual property, management functions, functional management, goodwill, certificate, environmental permits, operating permits.

Introduction

The implementation of an effective policy of asset management of the enterprise, which includes intangible assets, is of key importance for industrial enterprises in conditions of financial instability.

Scientific and technological progress gives advantages to those economic entities that closely connect their activities with innovative products, technologies, equipment, etc. They are more competitive and enjoy additional income due to the uniqueness of the products they produce, property rights, utility models, know-hows, inventions and other intellectual property.

Intellectual property items in the financial statements are defined as intangible assets and occupy a small share in the currency structure of the balance sheet of Ukrainian enterprises. This is explained by the fact that there is no motivation to use them in Ukraine, since the image of enterprises or goodwill is not calculated and included in the balance sheet, i.e. it does not affect the market value of the industrial enterprise and does not increase its creditworthiness. In the developed countries, goodwill is a separate balance sheet item that is valued each fiscal year.

The study of metallurgical enterprises of Ukraine shows that intangible assets are mainly software, so their value is small.

The analysis of the reporting of similar enterprises in the United States and Poland shows the presence, in addition to goodwill, of intangible assets, permits and property rights to hold material,

fuel and energy resources. Their application requires adjustment of regulations of Ukraine on the use of intangible assets, as well as the development of organizational and methodological principles for the implementation of intellectual property functional management.

Literature overview

Establishing an effective system of intellectual property management of industrial enterprises faces the issue of defining the essence of some of its items, such as: goodwill, property rights, certificates of origin, etc. In addition, the issues of reflecting intellectual property in the financial statements of enterprises are not fully identified.

The issue of the essence, role and calculation of goodwill is devoted to regulations and scientific articles of both Ukrainian and foreign authors. Thus, in the Bulletin of the Tax Service of Ukraine goodwill is defined as “..excess of the purchase value of the firm over the current value of all its assets. It is not associated with an increase in the number of active operations, it is determined by the profitability and financial stability of the firm, the strength of trade relations, reputation among buyers and suppliers, the location of the firm, etc.” [1].

In the paper [2], the concept of “goodwill” is revealed in three categories: goodwill as “main reputation”, “intangible asset”, and as “main reputation and intangible asset”.

In the first definition, goodwill shows the benefits that the company receives from a good reputation - additional sales, i.e. income, increased profitability and more.

As an intangible asset, goodwill is accounted for and shows all assets that an enterprise cannot consider in preparing its financial statements in accordance with International Financial Standard No. 3, which include knowledge, market position, marketing organization, and so on. This approach, in our opinion, is wrong, since it changes the economic essence of the concept [2].

Marco Giuliano [2] defines that as the main reputation and intangible asset, the concept of “goodwill” is based on obtaining a synergy effect from the acquisition or merger of one company and another.

In contrast to Marco Giuliano, the paper [3] presents a study on the depreciation of goodwill and the risk of reducing its value. The author notes that goodwill has a stimulating effect [4] in the first three years of the company's merger, and then the reputation deteriorates [5] and there is a risk of lowering the cost of goodwill.

The authors of [6] note that the use of goodwill can “increase capital and reduce financial results”. It is impossible to agree with the authors of the paper [6], because the value of goodwill affects the increase in capital and, if depreciation is charged on goodwill as an intangible asset, costs are reduced and profit before tax is increased.

Moreover, in the paper [6], goodwill as an economic category is used in foreign countries and in Russia. In accordance with International Financial Reporting Standard No. 3, assets that have not been used in the financial statements prior to the merger, such as acquired and previously

unrecognized brand names, patents and customer relationships, may be added to this asset. Thus, these are assets that have been created and developed internally before the acquisition or merger agreement.

In the paper [7], the intellectual property items include:

- geological information, i.e. the right to use geological information, which is capitalized on the amount of costs incurred for its acquisition, and written off during 5 up to 45 years;
- software, i.e. purchased software licenses, which are capitalized on the costs incurred to purchase and prepare for the use of specific computer software for a period of 2 up to 10 years;
- energy origin certificates, i.e. ownership of energy produced from renewable energy sources and the right to replace energy.

Industrial enterprises need large volumes of natural gas for production purposes and have the technical capacity to produce their own energy sources, so energy origin certificates for Ukrainian enterprises are extremely relevant.

The reporting of US companies [8] shows how to reduce the value of goodwill and other intangible assets for companies in bankruptcy. Thus, the value of goodwill decreases as a result of the elimination of contracts with customers, property permits, reduced sales and discounted cash flow rates to the weighted average cost of capital. In this case, goodwill is calculated for separate segments (business), which allows, in our opinion, to conduct a reasonable assessment.

Other intangible assets include U.S. environmental and operating permits required to operate a coal export terminal in accordance with regulations of the United States Environmental Protection Agency (EPA) and other regulatory authorities. The useful life is 27 years from the date of purchase [8]. Depreciation is calculated on their value.

Thus, there are real opportunities for Ukrainian industrial enterprises to increase the value of intangible assets through the introduction of new intellectual property, such as: goodwill, geological information, certificates of origin, environmental and operational permits. However, to address these issues, the intellectual property management system, namely the functional approach should be improved.

In the papers [9], [10], [11], the functional approach to management is recognized as integrated, which is built on a clear division of functional responsibilities between separate participants in the production process and is based on the functions established in management theory. In the paper [11], the author identifies the functions of management that should be used in the management of intellectual property are planning, organization, regulation, implementation, legal protection, control and accounting.

The author of the paper [12] adds the function of motivating staff to create intellectual property to the above functions.

Thus, the analysis of literature sources on the formation of intellectual property, their classification in the form of intangible assets, costing and accounting has shown that the use of goodwill, environmental and operational permits, energy origin certificates comprise the debatable issue. An increase in the value of intangible assets increases the market value of the enterprise, cost of

production, net cash flow and reduces the income tax. In order to introduce new intellectual property items, the existing management system according to the functional approach with a clear division of responsibilities between the separate divisions of the enterprise should be improved.

Research findings

It is proposed to improve the intellectual property management system according to the functional approach (or functional management) of Ukrainian industrial enterprises in line the established procedure (Fig. 1)

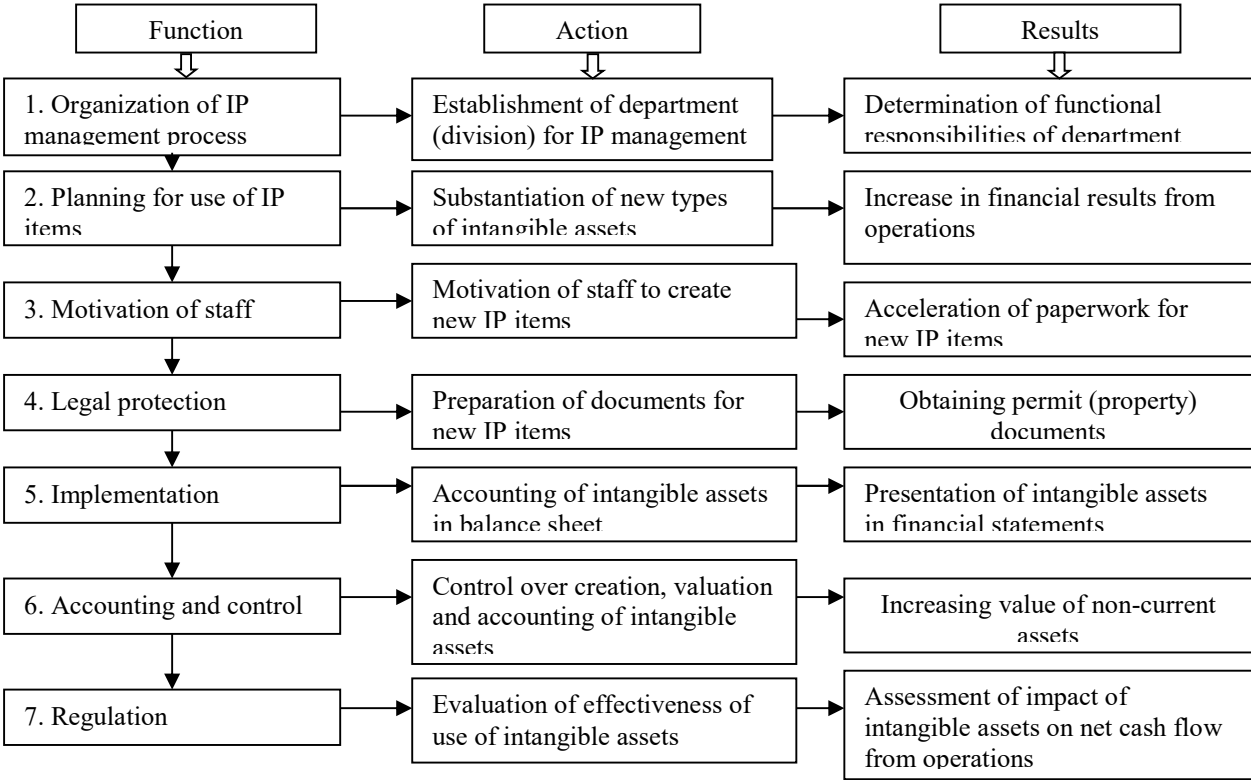


Fig. 1. Intellectual property management procedure according to functional approach

Source: built by the authors

The management of intellectual property for large financial and industrial groups such as the international vertically integrated mining and metallurgical group “Metinvest” should be improved in the following stages:

1. Expansion of the company through acquisition of new enterprises, which helps improve the company's image, and the calculation of the value of goodwill;
2. Obtaining geological information and its capitalization, which gives the right to use it;
3. The right to sell energy of own production by obtaining a certificate of origin of energy and fuel (gas, heat, electricity) from renewable energy sources;
4. Obtaining environmental permits;
5. Obtaining operating permits for the use of the coal export terminal.

To implement the first stage, it is advisable to choose methods of evaluating and accounting for goodwill. In the paper [1], the experience of foreign countries and Ukraine in the use of goodwill is presented (Table 1).

Table 1. Comparative analysis of the use of goodwill in foreign countries and in Ukraine [1]

Country	Characteristic features of goodwill according to the established criteria			
	Initial value	Asset useful life	Depreciation, write-off of asset	Reflection of negative goodwill in reporting
Goodwill is positive				Negative
Belgium	The difference between the price paid for a subsidiary and the carrying amount of its net assets	Five years	Depreciable, gradual write-off	Not displayed
Great Britain and Belgium	The difference between the undistorted cost of acquisition and the undistorted value of separate components (assets)	The asset useful life is substantiated in the profit and loss statement	Depreciation is not subject to taxation, write-off to the reserve	Immediately written off to reserves
Greece	Intangible asset	Five years	Depreciable, taxable	Goes to reserves or written off for losses
Estonia	The difference between the purchase price and the real value of net assets	Five years	Depreciable, gradual write-off	It is not reflected in the balance sheet or written off for losses
Spain	The difference between the price paid for a subsidiary and the carrying amount of	Ten years	Depreciable, not taxable	Written off for losses

	its net assets			
Italy	The difference between the undistorted cost of acquisition and the undistorted value of separate components (assets)	Five years	Depreciable, gradual write-off	Reserve or provision to cover future expenses
Germany	The difference between the market value of purchased net assets and investment costs	Forty years	Depreciated, slowly - gradual write-off	Written off for losses
France	Intangible asset that arises upon the acquisition of a company	Twenty to forty years	Depreciable, not taxable	Written off for losses
Sweden	Fixed assets	Ten years	10%	Long-term liabilities
USA	The general valuation method is the difference between the purchase price and the market value of net assets. The method of additional profit is the excess of the company's profit margin over the industry average profit margin	Up to forty years	Depreciable	By reducing the value of assets
International Accounting Standard No. 22	The difference between the purchase price (investment) and the appraised value of the assets and liabilities acquired at the date of the transaction.	Established by the companies, but may not exceed twenty years	The method of depreciation is set by the company, but more often it is straightforward.	The effect of exceeding the real value of assets and liabilities over the costs of acquiring the company. treated as income in the profit and loss statement
Ukraine	excess of the cost of acquisition over the buyer's interest in the fair value of the assets and liabilities acquired at the acquisition date	Up to twenty years	Monthly depreciation	If the activity is projected to be profitable, it is recognized as income, and if unprofitable, it is

				recognized as a loss.
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Thus, goodwill is an economic indicator that is calculated as the difference between the price paid for a subsidiary and the carrying amount of its net assets; it is an intangible asset because it characterizes: the company's reputation; the difference between the expected future profit and regulatory (industry) profit from all assets of the firm, except for goodwill; excess of the value of the enterprise as a going concern over the set of estimates of its net assets [1]. It can be positive or negative, written off immediately at the expense of profit or loss, and gradually over the useful life by accruing depreciation, which may be or may not be taxable.

Thus, the use of goodwill requires consideration of applicable regulations on international financial reporting standards or national accounting regulations. Goodwill is almost never used in Ukraine, although there is a legal framework for it.

Industrial enterprises that are part of metallurgical facilities, mining and metallurgical groups, associations of the coke industry, etc., require large amounts of material resources, such as: coal, fuel, ore, etc. Studies of the current state of the coke industry of Ukraine have shown the dependence of its operation on the presence of different brands of coal (especially brand K), the production of which remained in the occupied territory of Donbass. As a result, the production of coke in January 2021 to January 2020 is 84% [13], and the production of metallurgical coke is 96.1%.

Thus, there is a great need to acquire mines, land and subsoil rights.

The paper [14] notes that “Metinvest” has acquired a controlling stake in “Pokrovskaya Coal Group”, the largest producer of coking coal in Ukraine.

JASTRZĘBSKA SPÓŁKA WĘGLOWA SA (Poland) also has mines, so goodwill is included in the consolidated financial statements. Capitalized costs for mines are recognized in accordance with the volume of coal production from the relevant sites. After incurring costs, the mine is actually liquidated [7]. Goodwill in the financial statements for 2019 is PLN 57 000,000. The useful life of goodwill is five years. Write-off is carried out through depreciation.

In addition to the goodwill, intangible assets of JASTRZĘBSKA SPÓŁKA WĘGLOWA SA (Poland) include geological information, i.e. the right to use it, which at the end of 2019 amounted to 15.4 million zlotys. Moreover, it is depreciated over a period of 5 to 45 years. Taking it into account, the net (1) and gross (2) value of geological information is calculated:

$$NV = [(IV_{gi} * ADr) * T]/100 + Vincr_{gi} - Vdecr_{gi} + Bacq \quad (1)$$

where NV is net value of geological information, million conventional units; IV_{gi} - the initial cost of geological information, million conventional units; ADr is annual depreciation rate,%; T is useful life, years; $Vincr_{gi}$ and $Vdecr_{gi}$ are the cost increases and the cost decreases, respectively, million conventional units; Bacq is acquired business, million conventional units.

$$GV = NV + D_{accum} \quad (2)$$

where GV is gross value of geological information, million conventional units; D_{accum} is accumulated depreciation for the entire life of the asset, million conventional units.

The net value of geological information is the residual value of an intangible asset, and gross value is the initial cost and amounts that characterize its increase or decrease, as well as the acquisition of similar business.

In the process of coke production, coke plants receive coke oven gas (Fig. 2). They treat it. Then, a part of this gas goes to its own production, a part is transferred to third parties, and a part pollutes the air. Figure 2 shows that PJSC Avdiivka Coke Plant transmits the least of coke oven gas to third parties, i.e. it pollutes the air the most. Since 2016 PJSC "Zaporizhkoks" has increased the volume of fuel transfers. In this case, coke oven gas is used for electricity production, natural gas replacement, heat supply, steam and compressed air production.

In the financial statements of coke plants as an intangible asset it is advisable to use a certificate - the right to sell energy of their own production from renewable energy sources. It confirms that the fuel and energy resources produced by the coke plant meet the requirements of technical regulations and standards. Its cost is proposed to be calculated by the formula:

$$NV_{end} = NV_b + V_{incr_c} - V_{decr_c} \quad (3)$$

where NV_{end} is net asset value at the end of the period, million conventional units; NV_b is net book value at the beginning of the period, million conventional units; V_{incr_c} , V_{decr_c} are the cost increases and the cost decreases, respectively, million conventional units.

The net book value of the certificate of origin should be calculated as a percentage of the cost of sales of fuel and energy resources produced from coke oven gas.

An intangible asset that gives coke plants the right to obtain environmental permits, which characterize the maximum permissible concentrations of harmful substances, is subject to taxation. Yes, the US company Suncoke Energy, Inc. (USA), engaged inter alia coke-chemical activities, has permits in its financial statements representing the environmental and operational permits required for the operation of the coal export terminal in accordance with the US Environmental Protection Agency ("EPA") and other regulatory authorities. The useful life of the permits was estimated at 27 years from the date of acquisition. They take into account the expected useful life of significant operating equipment. The permit is regularly renewable [8].

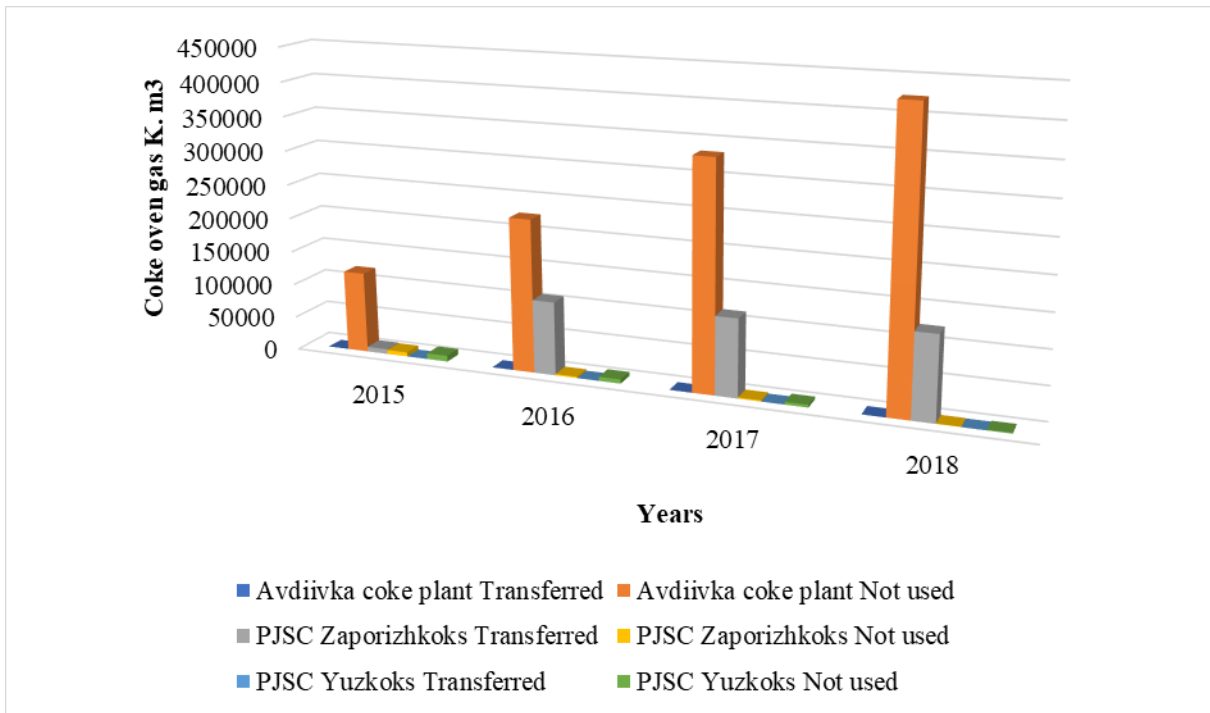


Fig.2. Dynamics of coke oven gas transfer to third parties

Source: built by the authors based on the papers [15-17]

The report of the Ukrainian Scientific and Industrial Association “Ukrkoks” (UNPA “Ukrkoks”) states that coke plants receive coal from around the world (Fig. 3), so the operating permit is also relevant for them.

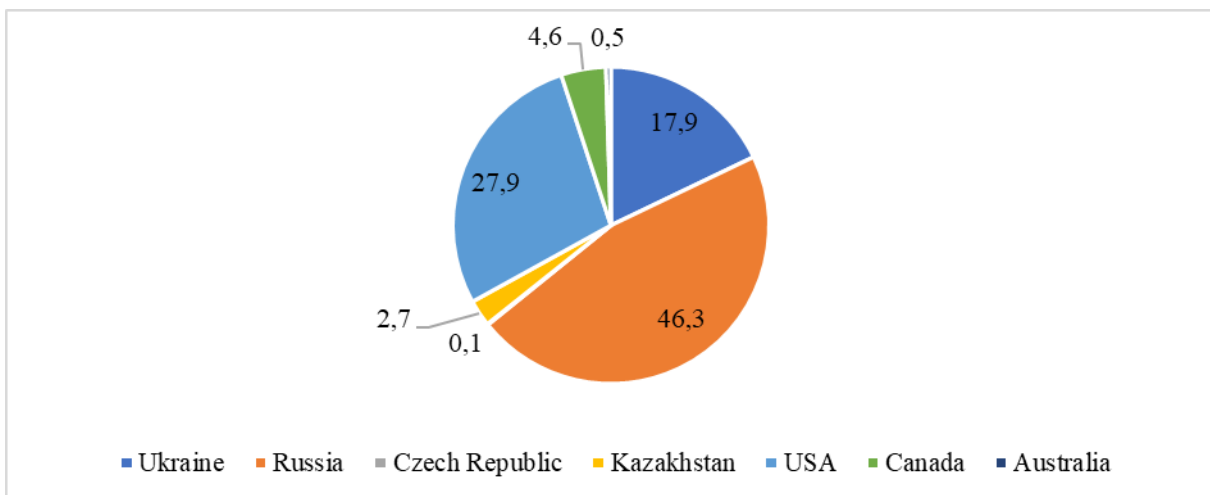


Fig.3. The structure of the coal balance for 2018 according to UNPA “Ukrkoks”

Source: built by the authors based on the paper [18]

Conclusions

To date, industrial enterprises are facing three main issues:

1. Search for measures to increase the value of assets to improve the financial condition, creditworthiness and image of the company;
2. Reduction of taxes and increase of net cash flow from operations;
3. Improved management of intellectual property of enterprises for the use of other intangible assets, such as: rights to use geological information, certificate of origin for the sale of fuel and energy resources of own production from renewable energy sources, environmental and operational permits.

The article proposes a methodical approach to solving these issues through the introduction of intellectual property functional management. Thus, Figure 1 shows the procedure for managing intellectual property through a functional approach, which shows that the management process uses seven management functions; their actions and the results to which they lead are established.

It is proposed to improve the intellectual property management in five stages, which include the acquisition of new enterprises and the determination of positive or negative goodwill (the company's reputation); the right to use geological information; certificate of origin for the sale of fuel and energy resources of own production from coke oven gas; environmental (for maximum allowable emission concentrations) and operational (for the purchase of imported coal) permits.

To introduce goodwill as an intangible asset, the article analyzes its application in practices of foreign countries and in Ukraine (Table 1) according to the following criteria: on positive goodwill - calculation of initial cost, useful life, depreciation, write-off of assets from the balance sheet; on negative goodwill - reflection in the reporting.

To determine the feasibility of applying a certificate of approval for the sale of fuel and energy resources by coke-chemical enterprises of Ukraine, Figure 2 analyzes the current state of transfer of coke oven gas to third parties and gas that is not used by enterprises but pollutes the environment. The introduction of the certificate of origin will stimulate enterprises to sell fuel and energy resources.

The use of environmental permits will aim at making coke plants to reduce air pollution, water reservoirs to allowable (limit) concentrations.

Operating permits are aimed at reducing the use of imported coal and building partnerships with domestic mines.

Thus, this article examines the current features of intellectual property functional management, its organizational aspect, which will allow companies to increase the efficiency of their activities and stabilize the financial condition.

In the further research, it is expedient to consider in more detail the issues of construction and functioning of an intellectual property management department in the industrial enterprises.

References

1. Goodwill: foreign and domestic experience. Available at: <https://zakon.rada.gov.ua/rada/show/n0047697-03#Text>

2. Marco Giuliani, Defining Goodwill: A Practice Perspective. *Journal of Financial Reporting and Accounting* 9(2). 2011, pp. 161-175. doi: 10.1108/19852511111173112

3. Ping Yi , The impact of VAM on goodwill impairment —Based on civil engineering construction industry. 2020 10th Chinese Geosynthetics Conference & International Symposium on Civil Engineering and Geosynthetics (ISCEG 2020). Volume 198, 2020. Available at: <https://doi.org/10.1051/e3sconf/202019803033>

4. Huang Hong, Zhong Zhiming , Merger premium, VAM and Impairment of Goodwill [J]. *Friends of accounting*, (10). 2020, pp.78-84. Available at: <https://www.e3s-conferences.org/articles/e3sconf/abs/2020/58/contents/contents.html>

5. Tian Guoshuang, Gu Manjia., Research on the Impact of Performance compensation Commitment on goodwill impairment [J]. *Friends of Accounting*, (13). 2020, pp.58-63. Available at: https://www.e3sconferences.org/articles/e3sconf/ref/2020/58/e3sconf_isceg2020_03033/e3sconf_isceg2020_03033.html

6. Kuzmenko O.A. and Dyachkova-Politi A.M. Genesis of the Definition “Goodwill” as Economical Category: International and Russian Aspect. 17th International Scientific Conference “Problems of Enterprise Development: Theory and Practice” 2018. Volume 62, 2019. Available at: doi.org/10.1051/shsconf/20196201004

7. Jastrzębska Spółka Węglowa S.A.'s Investor Relations website. Available at: <https://www.jsw.pl/en/investors-relations>

8. SunCoke Energy, Inc. Available at: <http://www.suncoke.com/English/investors/sxc/overview/default.aspx>

9. Yegupov Yu. A., Development of approaches to the formation of the production program of the enterprise. *Innovation economic*. No. 3-4. 2016, pp. 50-56. - Available at: http://nbuv.gov.ua/UJRN/inek_2016_3-4_9

10. Lyashenko P.B., Basic approaches to business management. *Young Scientist*. No. 12(1). 2018, pp. 296-301. Available at: http://nbuv.gov.ua/UJRN/molv_2018_12%281%29_7

11. Shykova L.V., Of theoretical of aspect of intellectual property management are on an enterprise. *Theoretical and Practical Aspects of Economics and Intellectual Property*. Issue 1(10), Volume 2. 2014, p. 98-104. Available at: <https://core.ac.uk/download/pdf/72006814.pdf>

12. Sylka I., Functional Management of Intellectual Property of Industrial Enterprises: Process and Functional Approach, Tools and Methods of Knowledge Management in the Innovative Development System of Organizations: monograph /edited by Ph.D. n economics, Assoc.Professor Yu. S. Shipulina. — Sumy: Trytoriia, 2019, p. 149 -171. Available at: <http://repository.kpi.kharkov.ua/handle/>

13. Ukrstat. Available at: <http://www.ukrstat.gov.ua>

14. Metinvest B.V. Available at: <https://interfax.com.ua/news/economic/728351.html>

15. Avdiivka Coke Plant. Available at: <https://akhz.metinvestholding.com/ua/about/info>

16. Zaporizhkoks. Available at: <https://zaporozhcoke.com/informacija-dlja-akcionerov/ustav-obshhestva/?lang=ru>
17. Yuzhkoks. Available at: https://bkoks.dp.ua/information_shareholders/
18. Ukrkoks Available at: <http://ukrkoks.com/>
19. Pererva P.G. Kocziszky György, Szakaly D., Somosi Veres M. Technology transfer.- Kharkiv-Miskolc: NTU «KhPI». 2012. 668 p.
20. Pererva P., Nagy S., Maslak M. Organization of marketing activities on the intrapreneurship // MIND JOURNAL // Wyższa Szkoła Ekonomiczno-Humanistyczna.- No.5. 2018. - Access mode: [:https://mindjournal.wseh.pl/sites/default/files/article/0918/organization_of_marketing_activities_on_the_intrapreneurship.pdf](https://mindjournal.wseh.pl/sites/default/files/article/0918/organization_of_marketing_activities_on_the_intrapreneurship.pdf)
21. Pererva P.G. Compliance program of an industrial enterprise: essence and tasks // Bulletin of the National Technical University "Kharkiv Polytechnic Institute" : Sb. sciences Ave. – Kharkiv : NTU "KHPI". No. 24 (1246). 2017. P.153-158.
22. Kocziszky Gy., Pererva P.G., Somosi Veres M., Kobieliava T.A. Compliance program: [tutorial] / P.G.Pererva [et al.]; ed.: P.G.Pererva, G.Kocziszky, M. Veres Somosi. – Kharkov ; Miskolc : NTU "KhPI". 2019. 689 p.
23. Pererva P.G. Practical Marketing.- Issue 6. Management of sales of industrial products in the marketing system.- M. : NGO "Advertising, information, marketing". 1991. 93 p.
24. Pererva P.G. Practical Marketin.- Issue 2. Marketing at an industrial enterprise. M. : NGO "Advertising, Information, Marketing". 1991. 80 p.
25. Tkachova NP, Pererva P.G. Development of methods of analysis of the actual state of competitive advantages of the enterprise // *Economics of development*. 2011. № 4 (60). p. 116-120.
26. Pererva P.G., Kocziszky Gy., Somosi Veres M., Kobieliava T.A., Compliance program of an industrial enterprise. Tutorial. - Kharkov-Miskolc: NTU "KhPI". 2018. 689 p.

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