INTERNET ANALYSIS OF SCIENTIFIC REQUESTS IN THE FIELD OF THE ENTERPRISE PERFORMANCE MANAGEMENT

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The relevance of scientific research and its dynamics in the field of the enterprise performance management have been analyzed.

The conceptual apparatus in the field of management of the financial and economic result of the enterprise industrial and economic activity has been systematized on the basis of the results of Internet analysis of scientific requests.

Internet-based analysis of a set of search requests in the best known Google international search engine was used as a research method. The term "management of the financial and economic result of the enterprise industrial and economic activity" has been defragmented into the relevant components: the financial result, the economic result, industrial activity, economic activity, activity of the enterprise, management. This has made it possible to form the basis of the categorical apparatus of the enterprise performance management.

The last five years, from 2013 to 2017, were selected as the study period for objective assessment of the relevance and dynamics of each conceptual category. The data have been analyzed as of the beginning of each quarter. The number of requests in the field of the enterprise performance management has been found to be growing in the last five years. The main tendencies of changes in this direction and the factors that caused them have been highlighted. Forecasts of the dynamics of searches within the selected categories for the next five periods have been made by constructing nonlinear trend models.

The actuality of the selected directions of research under modern economic conditions and the necessity for further research, development of new methods of enterprise performance management have been proved.

Keywords: financial and economic result, industrial and economic activity of the enterprise, method of internet analysis of scientific requests, Google Trends.

ІНТЕРНЕТ-АНАЛІЗ НАУКОВИХ ЗАПИТІВ У СФЕРІ УПРАВЛІННЯ РЕЗУЛЬТАТОМ ДІЯЛЬНОСТІ ПІДПРИЄМСТВА

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Проаналізовано актуальність наукових досліджень та їх динаміку у сфері управління результатом діяльності підприємства.

Систематизовано понятійний апарат у сфері управління фінансово-економічним результатом виробничо-господарської діяльності підприємства на основі результатів Інтернет-аналізу наукових запитів.

Як метод дослідження використано Інтернет-аналіз великої кількості пошукових запитів у найбільш відомій міжнародній пошуковій системі Google. Дефрагментовано поняття "управління фінансово-економічним результатом виробничо-господарської діяльності підприємства" на відповідні складові: фінансовий результат,

економічний результат, виробнича діяльність, господарська діяльність, діяльність підприємства, управління. Це дозволило сформувати підґрунтя категорійного апарату управління результатом діяльності підприємства.

Для отримання об'єктивної оцінки актуальності кожної понятійної категорії та її динаміки як період дослідження було обрано останні п'ять років, з 2013 по 2017 рік. Проаналізовано дані на початок кожного кварталу. Встановлено, що протягом останніх п'яти років зростала кількість запитів у сфері управління результатом діяльності підприємства. Висвітлено основні тенденції змін у цьому напрямі та чинники, що їх зумовили. Здійснено прогноз динаміки пошукових запитів за обраними категоріями на наступні п'ять періодів шляхом побудови нелінійних трендових моделей.

Доведено актуальність обраних напрямів дослідження в сучасних економічних умовах та необхідність подальших досліджень, розроблення нових методів управління результатом діяльності підприємства.

Ключові слова: фінансово-економічний результат, виробничо-господарська діяльність підприємств, метод Інтернет-аналізу наукових запитів, Google Trends.

ИНТЕРНЕТ-АНАЛИЗ НАУЧНЫХ ЗАПРОСОВ В СФЕРЕ УПРАВЛЕНИЯ РЕЗУЛЬТАТОМ ДЕЯТЕЛЬНОСТИ ПРЕДПРИЯТИЯ

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Проанализирована актуальность научных исследований и их динамика в сфере управления результатом деятельности предприятия.

Систематизирован понятийный аппарат в сфере управления финансово-экономическим результатом производственно-хозяйственной деятельности предприятия на основе результатов интернет-анализа научных запросов.

Как метод исследования использован Интернет-анализ множества поисковых запросов в наиболее известной международной поисковой системе Google. Дефрагментировано понятие "управление финансово-экономическим результатом производственно-хозяйственной деятельности предприятия" на соответствующие составляющие: финансовый результат, экономический результат, производственная деятельность, хозяйственная деятельность, деятельность предприятия, управление. Это позволило сформировать основу категориального аппарата управления результатом деятельности предприятия.

Для получения объективной оценки актуальности каждой понятийной категории и ее динамики как период исследования были выбраны последние пять лет, с 2013 по 2017 год. Проанализированы данные на начало каждого квартала. Установлено, что в течение последних пяти лет росло число запросов в сфере управления результатом деятельности предприятия. Освещены основные тенденции изменений в этом направлении и факторы, которые их обусловили. Осуществлен прогноз динамики поисковых запросов по выбранным категориям на следующие пять периодов путем построения нелинейных трендовых моделей.

Доказана актуальность выбранных направлений исследования в современных экономических условиях и необходимость дальнейших исследований, разработки новых методов управления результатом деятельности предприятия.

Ключевые слова: финансово-экономический результат, производственно-хозяйственная деятельность предприятий, метод Интернет-анализа научных запросов, Google Trends.

Under conditions of market economy, enterprise activity aims to obtain maximum possible economic benefit, which is manifested in its financial and economic outcomes. They reflect all aspects of enterprise's activity: the level of its technology and organization of production, the efficiency of the management system, control of the level of expenses, etc. The financial and economic result of the enterprise industrial and economic activity reflects efficiency of its operational, financial, economic and investment activity.

Financial and economic results are sources of payments to the budget. Providing positive financial and economic results is one of the most important goals of enterprise activity. Therefore, financial and economic results have always been and will remain the subject of ongoing research. Under domestic conditions, the role of

determining the financial and economic results, their importance for enterprise development are increasing. In addition, in recent years, in Ukraine, the share of unprofitable enterprises has increased.

The question of formation, accounting and analysis of enterprise management performance was considered at theoretical and methodological levels in the works of such domestic and foreign economists as G. Azarenkova, B. Danylyshyn, I. Blank, N. Breslavtsev, F. Butynets, V. Grinova, T. Klebanova, V. Kovalev, B. Kolas, M. Kreinina, A. Pushkar, A. Tridid, A. Tereshchenko and others. Some aspects of enterprise management, in particular management of its financial result, were reflected in papers of such scholars, as O. Mykolenko [1], V. Ponomarenko [2], R. Shapoval [3], S. Yevseiev [4]. The works of A. Barseghyan [5], D. Gladun [6], S. Kavun [7], S. Munzert [8], O. Nazarenko [9], N. Paklin [10], D. Sivovolov [11], a Report by Docebo: E-Learning Market Trends & Forecast 2014 – 2016 [12], Global E-Learning Market 2016 – 2020 Report [13] and others, are devoted to studying the Internet analysis methods.

Acquaintance with the works published on the given problem has brought to a conclusion that the issue of the enterprise performance management has not been sufficiently studied in either scientific or practical aspects. An objective need for further deepening of research is connected with substantiation of the relevance of research in this direction. Despite the widespread interpretation of financial and economic results, discussions on the broader justification of these concepts are still underway in scientific literature. Thus, considering the meaningfulness of financial and economic results, the vast majority of researchers [3; 4] move to a more thorough definition of its components. They focus, first of all, on the processes of managing financial and economic results.

The conceptual apparatus in the field of the enterprise performance management has been systematized on the basis of the results of Internet analysis of scientific requests.

The notion of management of financial and economic results of the enterprise industrial and economic activity has been defragmented into the relevant conceptual categories that create the categorical apparatus. In this case it is possible to predict the development and estimate the current dynamics. Defragmentation allows using the method of Internet analysis. It has been done in the best-known international search engine Google, which freely uses the ban filter system. The method is based on creating a set of requests, and in this case this set of requests can be identified as spam from the search engine service [11].

Google Trends is a Google-based public web application that shows how often a term is searched in relation to the search volume across different regions of the world and in different languages. On the horizontal axis of the main graph the time is presented, and on the vertical one you can see how often the term was searched in relation to the total number of searches around the world. The main graph shows the region-, city- and language-based distribution of popularity. The Google Trends app is commonly used to assess the effect of branding campaigns, to predict product demand. It helps clearly see how the popularity of Internet requests increases. In addition, the applied method has been tested in various industries and has proved its adequacy [7].

In order to objectively assess the relevance and dynamics of each conceptual category, the last five years, from 2013 to 2017, were selected as the study period. The data have been analyzed as of the beginning of each quarter. The statistics for this period were obtained using the corresponding request language structure. It included the actual conceptual category, the time element from the research range, and the logical function that binds the selected elements. The diagram of the distribution of values of requests of the concept "financial result" was built in the program Statistica 6.0 on the basis of the obtained data. It is presented in Fig. 1.
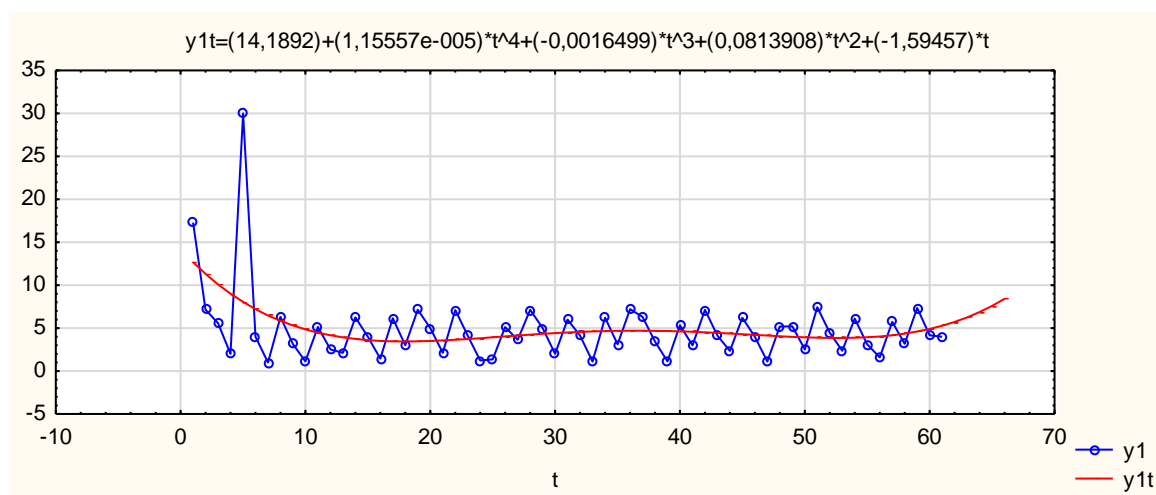

$$y1t=(14,1892)+(1,15557e-005)*t^4+(-0,0016499)*t^3+(0,0813908)*t^2+(-1,59457)*t$$

Fig. 1. **The diagram of the distribution of the values of requests for the concept "financial result"**

As shown in Fig. 1, nonlinear functions, in particular, the fourth degree polynomial, best fits a given data series. The x-axis represents quarterly data starting from March 1, 2013 (1st quarter) and ending January 3, 2018 (66th quarter). They correspond to the period t. It is an independent variable of the model.

The fourth degree polynomial was used, because polynomial approximation helps to describe variables that alternately increase and decrease (Fig. 1). Also, it is used to analyze a large set of data. The degree of a polynomial is determined by the number of extremums (maximum and minimum) of the graph.

The analysis of the given diagram has shown that the last five years were marked by periodic fluctuations in the number of references in the category "financial result". The largest number of requests was observed in the fifth study period (June 1, 2013). After this period we can observe that the total volume of references is quite stable and has a tendency to increase. It was because, under current conditions of financial market and emergence of a large number of new factors of influence, we need to increase the focus on their further research [1].

Approximation based on the trend model allowed getting more visualization of data about the number of links in the relevant category. Thus, calculation of model parameters in the program Statistica 6.0 allowed finding the predictive values of requests for the term "financial result".

From Fig. 1 it is evident that during the next five periods requests for the term "financial result" increase which confirms the relevance of the chosen topic of the study. The parameters of the constructed nonlinear model are shown in Fig. 2.

Model is: $y1=a0+a1*t^4+a2*t^3+a3*t^2+a4*t$ (Spreadsheet1)
Dep. Var. : y1

	Estimate	Standard error	t-value df = 56	p-value	Lo. Conf Limit	Up. Conf Limit
a0	14,18919	2,756660	0,00	0,00	8,66693	19,71144
a1	0,00001	0,000000	0,00	0,00	0,00001	0,00001
a2	-0,00165	0,000948	0,00	0,00	-0,00355	0,00025
a3	0,08139	0,039255	0,00	0,00	0,00275	0,16003
a4	-1,59457	0,605406	0,00	0,00	-2,80734	-0,38180

Fig. 2. **The parameters of the model of description of the dynamics of requests for the term "financial result"**

According to the results given in Fig. 2, the first column shows the parameters of the constructed models, and we can conclude that the investigated conceptual category has a fairly high value of reliability of approximation.

It is impossible to construct similar charts in the Google Trends application for the terms "financial and economic result" and "economic result" due to the lack of data, but it is advisable to compare the number of requests for the terms "financial result", "profit", "loss" (Fig. 3).

As can be seen from Fig. 3, the number of requests for the term "profit" far exceeds the number of requests for the terms "financial result", "loss". And the number of requests for the term "financial result" slightly exceeds the number of requests for the term "loss". This is explained by the fact that in accordance with GAAP, financial result is a broader concept than the net profit of the reporting period [2].

Financial result is a general indicator of analysis and evaluation of the efficiency (inefficiency). The ultimate financial result is net profit (loss) of the reporting period, cleared from all expenses and taxes. And it shows the integral enterprise performance [1; 4].
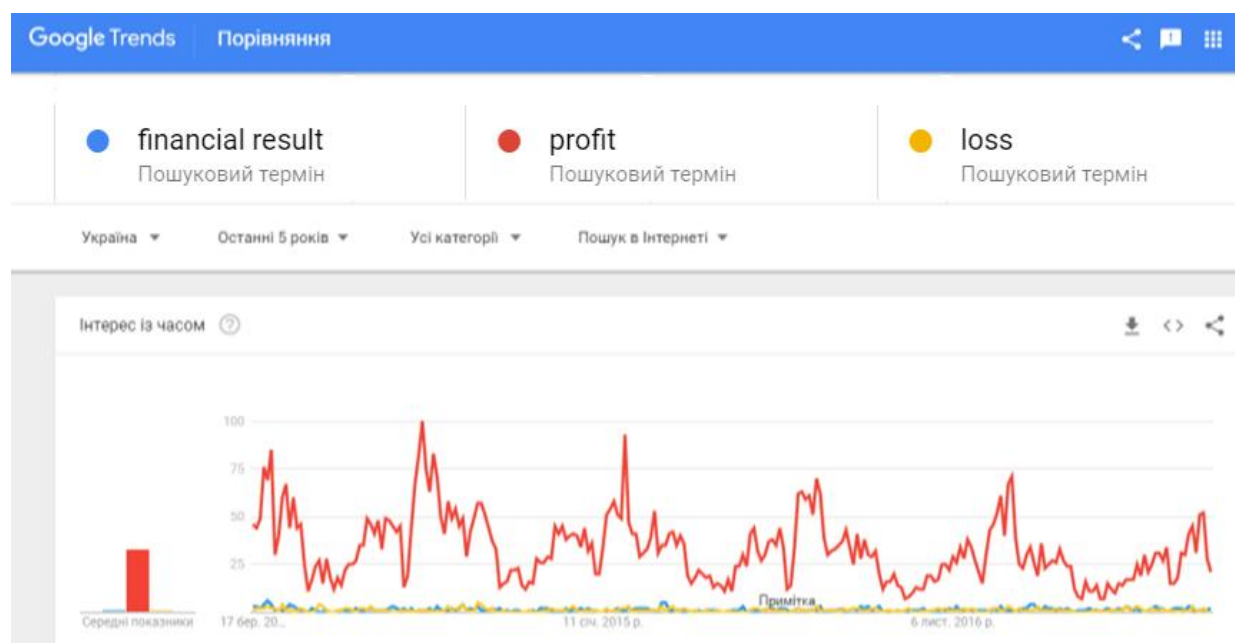

Fig. 3. **The diagram of the distribution of the values of the requests for the terms "financial result", "profit", "loss"**

The diagrams of the distribution of meanings of requests for the concepts "economic activity" and "industrial activity" are shown in Fig. 4 and 5.

The diagrams in Fig. 4 and 5 characterize a moderate increase in the level of links from 2013 to 2018. And the number of links is expected to increase in future periods.

From Fig. 4 and 5 we can see a significant similarity of the dynamics of the requests for the two analyzed concepts. This is due to the fact that for Internet users the analyzed terms are similar.

Thus, the enterprise economic activity is activity in the creation of goods, provision of services and execution of all possible work. It is aimed at obtaining income in order to meet the needs of management and staff. And industrial activity is aimed at manufacturing goods.

As a result, there is a change in material appearance of the raw material; and the price of primary raw materials increases by changing its appearance, composition or transformation [4].

The parameters of the constructed nonlinear models are statistically significant (Fig. 6 and 7).

The diagrams of the distribution of the values for the requests of the concepts "enterprise activity" and "management" are shown in Fig. 8 and 9. The significance of the parameters of the models describing the dynamics of requests for the corresponding terms is shown in Fig. 10 and 11.
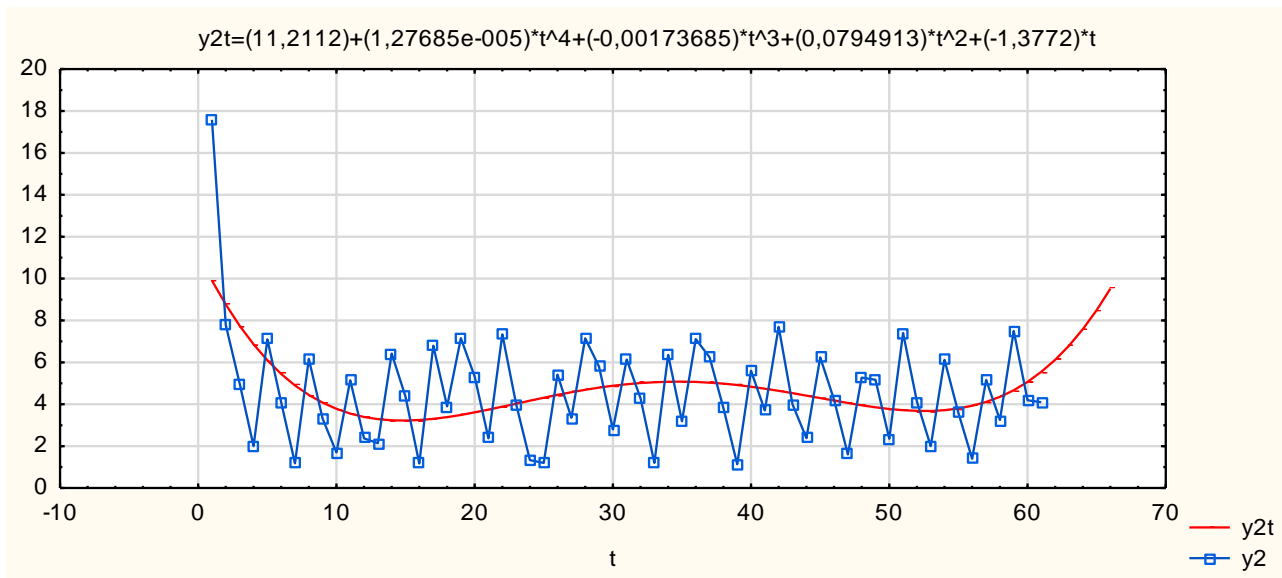
$$y2t=(11,2112)+(1,27685e-005)*t^4+(-0,00173685)*t^3+(0,0794913)*t^2+(-1,3772)*t$$

Fig. 4. **The diagram of the distribution of the values of requests for the concept "economic activity"**

$$y3t=(11,0733)+(1,23673e-005)*t^4+(-0,00168373)*t^3+(0,0773686)*t^2+(-1,35348)*t$$
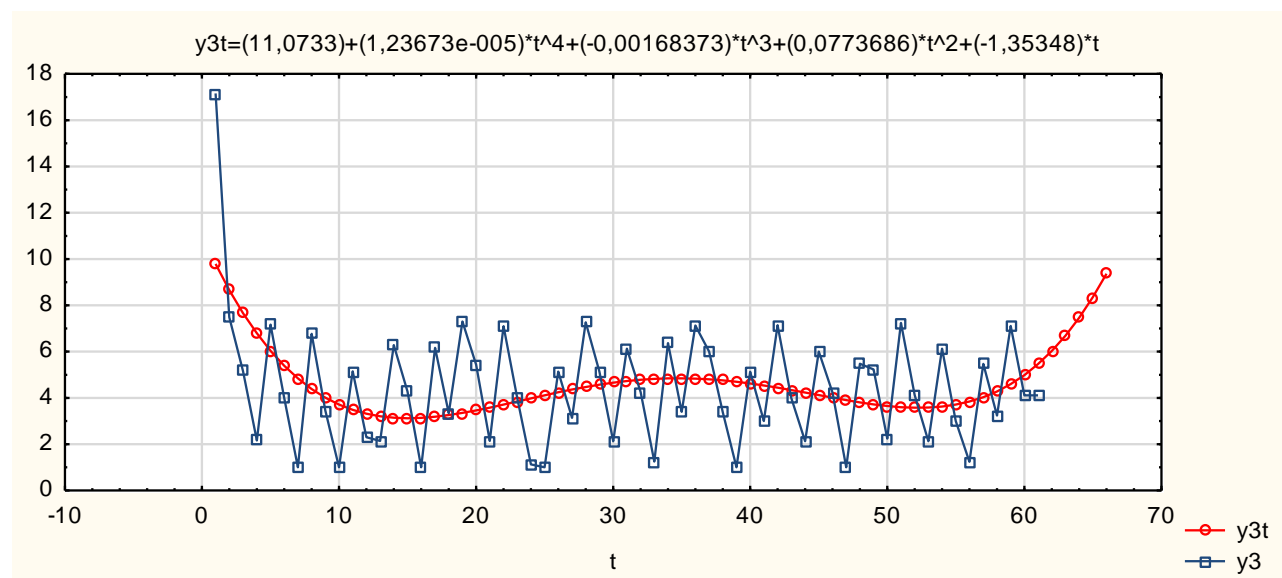
Fig. 5. **The diagram of the distribution of the values of requests for the concept "industrial activity"**

Model is: y2=a0+a1*t^4+a2*t^3+a3*t^2+a4*t (Spreadsheet3)
Dep. Var. : y2

	Estimate	Standard error	t-value df = 56	p-value	Lo. Conf Limit	Up. Conf Limit
a0	11,21118	1,711592	0,00	0,00	7,78245	14,63991
a1	0,00001	0,000000	0,00	0,00	0,00001	0,00001
a2	-0,00174	0,000588	0,00	0,00	-0,00292	-0,00056
a3	0,07949	0,024373	0,00	0,00	0,03067	0,12832
a4	-1,37720	0,375892	0,00	0,00	-2,13021	-0,62420

Fig. 6. **The parameters of the model describing the dynamics of requests for the concept "economic activity"**

Model is: y3=a0+a1*t^4+a2*t^3+a3*t^2+a4*t (Spreadsheet1)
Dep. Var. : y3

	Estimate	Standard error	t-value df = 56	p-value	Lo. Conf Limit	Up. Conf Limit
a0	11,07333	1,716473	0,00	0,00	7,63482	14,51184
a1	0,00001	0,000000	0,00	0,00	0,00001	0,00001
a2	-0,00168	0,000590	0,00	0,00	-0,00287	-0,00050
a3	0,07737	0,024442	0,00	0,00	0,02840	0,12633
a4	-1,35348	0,376964	0,00	0,00	-2,10863	-0,59833

Fig. 7. **The parameters of the model describing the dynamics of requests for the concept "industrial activity"**
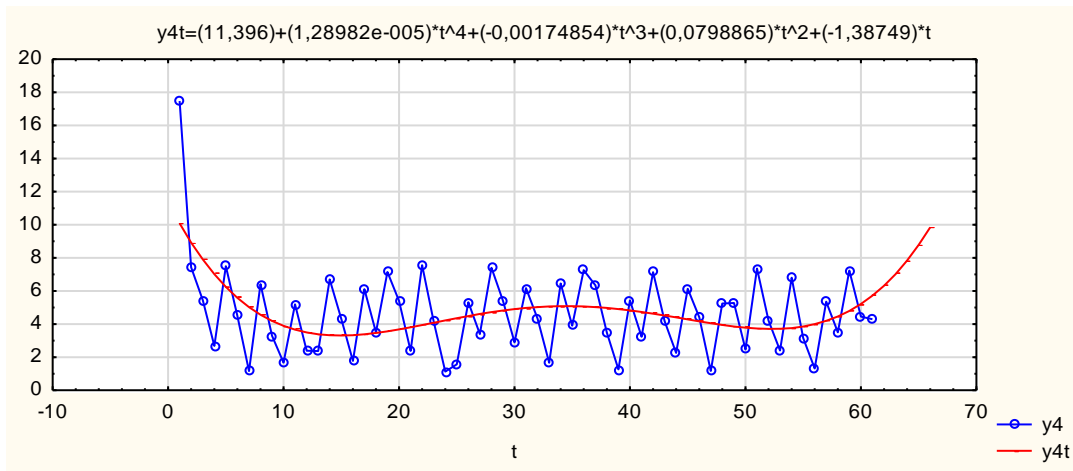
$y4t=(11,396)+(1,28982e-005)*t^4+(-0,00174854)*t^3+(0,0798865)*t^2+(-1,38749)*t$

Fig. 8. **The diagram of the distribution of requests for the concept "enterprise activity"**

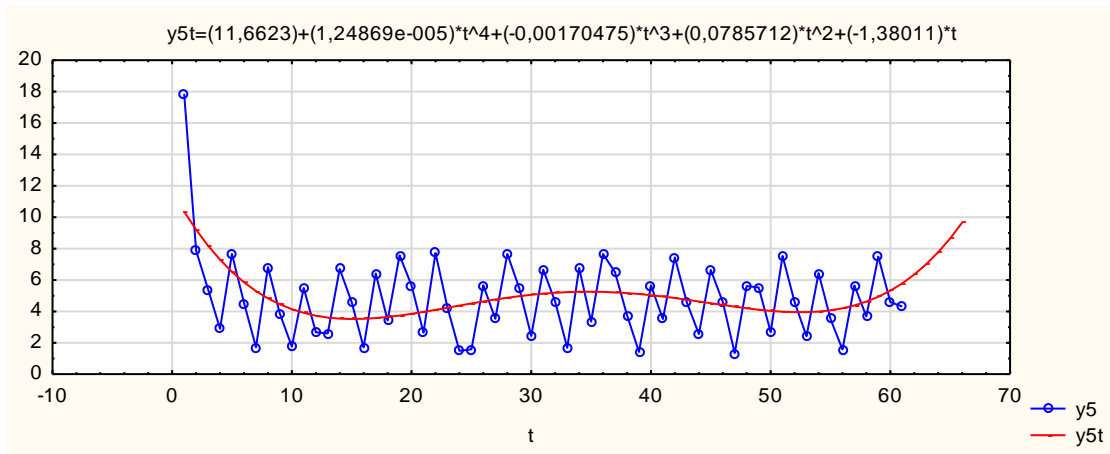$y5t=(11,6623)+(1,24869e-005)*t^4+(-0,00170475)*t^3+(0,0785712)*t^2+(-1,38011)*t$

Fig. 9. **The diagram of the distribution of requests for the concept "management"**

Model is: y4=a0+a1*t^4+a2*t^3+a3*t^2+a4*t (Spreadsheet6)
Dep. Var. : y4

	Estimate	Standard error	t-value df = 56	p-value	Lo. Conf Limit	Up. Conf Limit
a0	11,39603	1,667067	0,00	0,00	8,05649	14,73556
a1	0,00001	0,000000	0,00	0,00	0,00001	0,00001
a2	-0,00175	0,000573	0,00	0,00	-0,00290	-0,00060
a3	0,07989	0,023739	0,00	0,00	0,03233	0,12744
a4	-1,38749	0,366114	0,00	0,00	-2,12091	-0,65408

Fig. 10. **The parameters of the model describing the dynamics of requests for the concept "enterprise activity"**

Model is: y5=a0+a1*t^4+a2*t^3+a3*t^2+a4*t (Spreadsheet1)
Dep. Var. : y5

	Estimate	Standard error	t-value df = 56	p-value	Lo. Conf Limit	Up. Conf Limit
a0	11,66228	1,700783	0,00	0,00	8,25520	15,06936
a1	0,00001	0,000000	0,00	0,00	0,00001	0,00001
a2	-0,00170	0,000585	0,00	0,00	-0,00288	-0,00053
a3	0,07857	0,024219	0,00	0,00	0,03005	0,12709
a4	-1,38011	0,373518	0,00	0,00	-2,12836	-0,63187

Fig. 11. **The parameters of the model describing the dynamics of requests for the concept "management"**

Analysis of the data shown in Fig. 1 – 11 has revealed that the period from 2013 to 2018 was marked by a moderate increase in references to relevant conceptual categories. First of all, this growth was due to the need for improvement of the processes of enterprise management. During the last year the trend showed growth. Because the economy is in no hurry to recover, investors' interest in investing in the economy has also fallen due to mistrust [2]. The interest in the improvement of the management methods and enterprise activity arises during the period of greatest demand, which is forecasted for the next year. If there were stabilization of the situation, there would be a corresponding response of requests, a reduction in their number.

Thus, the obtained results have shown good stability in the field of the enterprise performance management. The growth of interest in these categories is expected in next periods. The parameters of the constructed models have been estimated to confirm the significance of the obtained results. According to the results of this estimation, all investigated conceptual categories have a fairly high level of reliability of approximation. It confirms a sufficiently high interest and increasing relevance of any research in the sphere of the enterprise performance management.

The obtained results of the research characterize the current state and dynamics of changes in the field of scientific research on the analyzed economic terms. It confirms the need for further research and development of new (actual) methods for the enterprise performance management.

The practical significance of the obtained results is that the constructed models can be used to predict the interest of Internet users in the field of the enterprise performance management and can confirm the relevance of studying this process.

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