

UDC 005.591.6:658

JEL Classification: C13, C53, C63, D89, M29

**Rosokhata Anna Serhiivna,***PhD Student of the Department of Marketing and MIA,  
Sumy State University (Sumy, Ukraine)*

## RATING TENDENCIES OF THE INNOVATIVE DEVELOPMENT PROGNOSTICATION SYSTEM AT THE INDUSTRIAL ENTERPRISE

**The aim of the article.** The article deals with the formational process of enterprise innovative directions on the basis of nowadays modern tendencies structured analysis. The practical realization of the innovative development prognostication process at the enterprise is confined mostly to the current market condition and economic viability analysis. The system of development innovative directions prognostication has no systematic complex approach, structured organization, set of elements, which provide to collect and rate nowadays tendencies, i.e. perspectives for future development. The object of an article is to form approach to the modern tendencies rating, which are observed within the introduction system concerning innovative development perspective directions prognostication at the enterprise – trend-watching.

**The results of the analysis.** The article demonstrates the research on concepts “trend” and “tendencies” economic aspect definition. The author presents the approach to prognosticate innovative development directions of industrial enterprises, based on social and economic development urgent tendencies research; that is the main point to investigate the research direction – trend-watching. The methodic of tendencies rating to decrease subjectivity level while prognosticating enterprise development directions, which is based on tendencies spreading speed determination, is also suggested. The main essence of the tendencies development quantitative concept consists in the fact, that, in order to know which level will be achieved in this or that process, it is necessary to know average speed of its change. So, the average speed of the process change may be rated. The article presents three tendencies features, including time, place and action. These perceptions give reason to define the tendency speed, that is the resultant factor of tendency development and spreading factor in the proper time taking into account the geographical space. In order to determine fairness of the tendency spreading in various geographical space zones author investigates that tendency belongs to the studied object. The experience to conduct marketing research, including geographical segmentation of interaction subjects at the industrial enterprise, is the main point to allocate tendencies spreading. There are distinguished such geographical space zones of the tendency spreading as enterprise productive branch; enterprise region; country where enterprise is working; world space in general.

**Conclusions and directions of further researches.** Each geographical space zone is given fairness coefficient; it results in making the formula to calculate tendencies spreading intensity, which is the base to express mathematically the speed of tendency spreading. To calculate the speed of tendency spreading will increase the objectivity to make decisions and allow to form a range of investigated tendencies in quantitative concept. Quantitative data concerning tendencies spreading speed gives opportunity to take up qualitative analysis into the new level, decreasing the subjectivity level and using formalized methods of innovative development directions prognostications at the industrial enterprises. The perspectives for further research consist in forming of approach to group tendencies by the spreading speed factor with aim to define base to create innovative development directions, i.e. the key aspects, characterizing investigated processes and phenomena.

**Keywords:** prognostication, innovative development direction, industrial enterprise, tendency, trend-watching, tendency spreading speed.

**Problem statement.** It is impossible to introduce innovative activity at the industrial enterprise absent normal technical, financial, material and intellectual resources without creating of management system. The control of innovative processes in long-term perspective

may be achieved owing to the future actions prognostications. The confirmation of scientific, technological, productive, organizational and market perspectives occurs while forming perception concerning future tendencies. They characterize quantitative and qualitative changes of economic factors, fully describe the modern society progress, economic potential, social achievements etc.

The urgent task for today is to create specialized prognosticated estimations concerning actions development while conducting innovative activity at the industrial enterprise. The practical realization of analysis and tendencies separation increases the effectiveness to prognosticate perspective innovative development directions at the industrial enterprises.

Nowadays the experience to manage innovative development of the industrial enterprises in Ukraine demonstrates low level of controllability concerning long-term perspective determination. The process of industrial enterprises innovative directions forming lacks the modern tendencies structured analysis. In order to realize the innovative development prognostication process at the industrial enterprise, one has to analyze market environment and economic reasonability. Innovative directions development prognosticated mechanism has no systematic complex approach, structured organization, set of elements, which foresee the collection and rating of today's perspectives, i.e. perspectives for future development. Such fragmentary character of prognostication foregrounds any prognostication accuracy condition, moreover long-term prognostication, basing on formalized analysis concerning long trends and tendencies of the social and economic development.

**Analysis of the recent research and publications.** The problem to choose innovative development directions at the industrial enterprises is enough investigated by Ukrainian and world scientists for today. Such scientists as L.L. Antoniuk [1], R.A. Fatkhutdinov [2], T.K. Kvasha [3], L.I. Fedulova [4], S.M. Illiashenko [5], O.A. Bilovodska [6], V.I. Dovbenko [7], O.Ye. Kuzmin [8], M.Ye. Rohoza [9], Yu.S. Shypulina [10], I.V. Odotiuk [11], H.T. Piatnytska [12], N.I. Chukhrai [13], K. Galanakis [14], E.M. Rogers [15], A. Kusiak [16] investigate the problem concerning innovative development effective management on the basis of right development directions choice. Therefore many scientists study problems, which appear while realizing innovative activity and its peculiarities, however, today in science there are no examples of methodic mechanism concerning innovative development directions prognostication, based on realization approach of nowadays tendencies information and their rating. Quantification of modern trends has been investigated in the international scientific society lately. Choosing various objects, for which trends and tendencies are actualizing, the estimation in the trend-watching system and its constituents is studies by Rex Yuxing Du, A. Wagner Kamakura [17], Bañbura M, Giannone D., Modugno M. [18], Reichlin, L. [18; 19], DeMol C. [19], Giannone D. [19], Carriero A. [20], Kapetanios G., Marcellino M. [20], Aruoba S.B., Diebold F.X., Scotti C. [21], Ma J., Kwak M., Kim H.M. [22], Gunnesch-Luca G., Klöble U., Göritz A.S., Moser K. [23]. These scientists take up aspects of tendencies estimation from different point and approaches, but methodic of tendencies rating was not been demonstrated earlier from the position concerning innovative development perspective directions prognostication at the industrial enterprise.

**Aim of an article** is to form approach to the rating of modern tendencies, which are observed in the system to introduce innovative development perspective directions prognostication at the trend-watching enterprises.

**Main material.** While studying trends and tendencies, the problem of their move and occurrence regularity during some period plays a great role. There are different

definitions [24] of the concept “trend”. Broadly defined, trend is a longtime change of the average casual process level [25]. The trend concept is borrowed from English “the trend”, that means “tendency”, that’s why these concepts are often viewed as similar terms in Ukrainian literature, i.e. they present opportunity of these of those actions to be developed in some way.

In general, trend is a new way for process development. Therefore, this way has features, which are shown in numbers, i.e. they are presented in formalized way. But there is a point of view, that “tendency” has another essence. It comes from Lat. “tendo” – direct, aim, the alternative is also the English word “tendency”, which means direction, orientation, from Latin “tenduntia” – addiction, from Latin “tendere” – drag, force, in this essence – to be interested, to consider, to direct (hence – tendentiousness).

By extension, tendency describes possibility to develop the process in the intended direction in proper time, i.e. it is a regular process change in proper time series. Tendency presents the development direction, peculiarities of which are presented in non-formalized form, and has describing character [25; 26].

For today terms “trend” and “tendency” are used in various activity spheres and subject areas: fashion, music, economics, marketing etc. Trend is widely used either to define quantitative features of the presented objects (e.g. in statistics, exchange activities, exchange market, planned and financial activity etc), or to determine qualitative object’s factors. In the second case the concept “trend” is widely used in the context of tendency.

There is a situation when tendencies, which are important in marketing and in the system of industrial enterprise management, may not be estimated statistically. It is when tendencies, appeared in society, need to be adapted to the formalized form and to be presented mathematically. The example is tendencies, which are the base to create directions for future development. There is a necessity of tendencies quantitative analysis, because the development direction is not reasonably to present in terms of experts’ minds.

Taking into account the above mentioned facts, the substantial instrument to form and to give rating for innovative activity development tendencies perspectives at the industrial enterprises is activity on watching and separating of new trends and tendencies.

Nowadays it is popular to apply such way of future prognostication, tendencies and trends determination, with which it is not necessary to consider historical process, but vice versa the fact of today’s analysis, future tendencies prognostication, based on innovative and creative. Such prognostication of the perspective development directions at the enterprise is called trend-watching.

**Trend-watching** (from English “trend” – tendency, “watching” – viewing) means the activity, oriented on watching of new tendencies. As a rule, this term is used to denote work of non-diversified departments in the marketing companies or independent trend-watching agencies. They conduct constant monitoring of new trends and prognosticate their necessity and success for the final consumer in future [27]. Together with concept “trend-watching”, there are also such as: foresight, trend-spotting and trend-hunting, trendsetting, which are oriented to process tendencies and to give recommendations concerning future actions development [28].

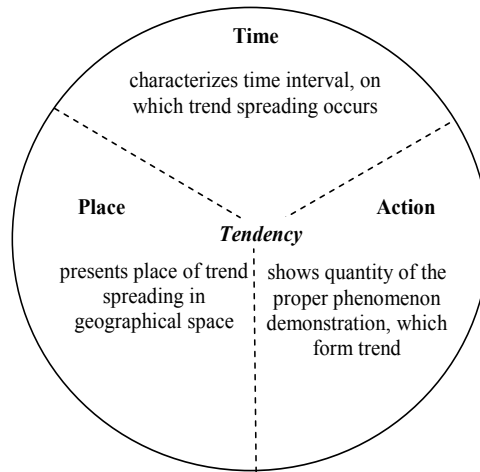
The tendency, formed in the trend-watching process, is regular change of the process in proper time series; perspective direction for process development in future. According to this interpretation the concept “tendency”, there are two main features, which characterize it. They include cases of process (tendencies) demonstration and time, during which these cases occur. These peculiarities give grounds for cases changes of process in time.

Cases of process demonstration, forming the tendency, have some quantity. It means that number of process demonstrations may be counted depending on the quantity of their physical expression times.

If we talk about the fact of concrete case concerning investigated process, it must certainly have geographical space, in which it occurred.

Together mentioned perceptions are three factors – time, space and quantity. These factors form tendency features, which form it, particularly time, place and action. The confirmation of the logic correlation between tendency features is trinity of time, place and action, i.e. classical unity by Aristotle [29]. This philosophical argument has already been adapted in economic scientific thought, e.g., Abell three-dimensional system [30].

The interconnection between these basic aspects of tendency forming may be presented in the following way (fig. 1).



*Figure 1 – Main features of trends forming*

While studying each tendency peculiarity in details, one should point out that to perceive changes regularities in time is complicated and hard process, because any investigated phenomenon forms many factors which act in different directions. But without taking into account time, during which tendency is developing, it is impossible to find its resultant meaning. The classical scientific mind shows us, that time series are the sequence of figures, regulated in time, which characterize level of state and change in studies phenomenon [31].

Each separate tendency time series are different, but in order to form one system of their estimation, it is necessary to achieve the only one time unit for the analysis in general. To time tendency (as perspective development direction) is not reasonably in seconds, hours and even days. Basing on information concerning this question, we conclude, that there are such optimal time units to measure trends: month, quarters, half-year, year etc. The maximal time interval for estimation may be 3-5 years. Most quantity of years is not rational, because during some time period researchers can hardly find common and distinctive issues in the concrete process cases, which forms the tendency. We put main principle into the tendency development quantification concept: in order to know which level will be achieved in the process, one needs to find out the average speed of its change. So, the average speed of the

process change forms tendency parameters, by which it may be estimated quantitatively.

Physics theory shows, that speed is a physical quantity, which is calculated by ratio of object motion to time interval, by which this motion occurs. The speed as a quantitative value is labeled with letter  $V$  (from Latin – Velocitas – speed) [32].

Speed is easy to determine, when there is equal and linear motion, i.e. it covers equal distances during equal times. In this case speed is determined as distance to time ration:

$$V = \frac{S}{t}, \quad (1)$$

where  $S$  – distance, covered by object during time  $t$ .

The adaptation of this formula (classical calculation of speed) has its further development in the tendency speed concept. The tendency speed is a resultant factor of the tendency development and spreading in proper time interval with regard to geographical space.

The parameter  $S$ , i.e. distance, which tendency covered, is reasonably to interpret to its spreading rate in society.

The process spreading rate in various scientific areas is considered differently, depending on investigated object. Since the object, for which tendencies will be studied in future, is the industrial enterprise in concrete location, it is logically, that tendency spreading rate will present quantity of phenomena demonstrations, which form the tendency. If we take into account the definition of tendency to determine innovative activity directions at the industrial enterprise, we should mention the important aspect – geographical space, where the process is spreading. The tendency demonstration in market closeness to the investigated enterprise and in more distant zones, e.g., in the nearest rival and at global stage, will impact differently the possibility to adaptation of this tendency in industrial enterprise activity. We may see that the closer zone to the enterprise, where tendency was spread, the more important effect on the investigated object activity, including innovative activity, is made. The factor of tendency spreading rate has to demonstrate not only the quantity of tendency physical demonstrations, but also geographical zones importance, where processes were demonstrated.

If each geographical zone is given farness coefficient depending on distance between tendency spreading place and industrial enterprise, farness coefficient and quantity of process demonstration cases product will present tendency spreading rate in given geographical zone. Sum of tendency spreading factors in separate zone will present the tendency spreading rate in general in geographic space.

It may be shown mathematically:

$$S = \sum_{i=1}^n p_i \cdot k_i, \quad (2)$$

where  $S$  – tendency spreading rate;  $p_i$  – tendency farness coefficient in  $i$ -zone of geographical space;  $k_i$  – quantity of tendency demonstrations in  $i$ -zone of geographical space;  $i$  – quantity of geographical space zones, where tendency development is studied.

In order to define tendency spreading farness in geographical space different zones, it is logically to study tendency belonging to the investigated object. In this case tendency rating which appears in society is conducted with aim to involve them into innovative activity at the industrial enterprise. The main idea of tendency spreading zones distinguishing is an

experience to carry out marketing research, particularly geographical segmentation of industrial enterprise subjects' interconnection. It is logically to distinct tendency geographical space (urgent for industrial enterprise) with the following constituents (zones):

- real sector, in which enterprise works;
- region, in which enterprise works;
- country, where enterprise functions;
- world space in general.

Observing the suggested zones of tendency spreading, one should distinguish such main principle: the closer to industrial enterprise tendency spreading occurs, the more probability and accessibility of its spreading at the enterprise.

If we accept two extreme points of tendency spreading: there was no tendency at all (0) and tendency was spread only at the investigated industrial enterprise (1), we will have opportunity to distinguish scale concerning relative expression of tendency spreading geographical space quantitatively. Therefore range of values from the case, when tendency was not spread, till the situation, when it was spread, is divided ratably with zones quantity. Thus, we have distinction of tendency farness coefficient values, shown in table 1.

*Table 1 – Values of the farness coefficients on tendency spreading geographical space*

Values of the farness coefficient on tendency spreading geographical space	Characteristics of the farness coefficient
0	situation, when there was no tendency at all;
0,2	tendency was spread in the international level;
0,4	tendency was spread in the country, where industrial enterprise functions;
0,6	tendency was spread in the region, where industrial enterprise functions;
0,8	tendency was spread in the real sector of industrial enterprise;
1	tendency was spread in activity of the industrial enterprise

While using quantitative values of the geographical space relative distinction, which is figuratively, divided into 5 equal tendency spreading zones, the tendency spreading speed is calculated:

$$V = \frac{S}{t} = \frac{\sum_{i=1}^n p_i \cdot k_i}{t} = \frac{p_1 \cdot k_1 + p_2 \cdot k_2 + p_3 \cdot k_3 + p_4 \cdot k_4 + p_5 \cdot k_5}{t} \quad (3)$$

In the case when analysis of tendency spreading speed occurs aimed to its adaptation to the enterprise activity, it is reasonably to substitute value from scale of tendency spreading geographical space relative quantitative expression for industrial enterprise instead of conditional farness coefficients  $p_i$ :

$$V = \frac{1 \cdot k_1 + 0,8 \cdot k_2 + 0,6 \cdot k_3 + 0,4 \cdot k_4 + 0,2 \cdot k_5}{t} \quad (4)$$

where  $V$  – speed of tendency spreading to introduce into innovative activity at industrial enterprise;  $k_i$  – quantity of phenomena demonstrations, which form tendency, within

enterprise activity;  $k_2$  – quantity of phenomena demonstrations, which form tendency, in the real sector at the industrial enterprise;  $k_3$  – quantity of phenomena demonstrations, which form tendency, in region, where enterprise works;  $k_4$  – quantity of phenomena demonstrations, which form tendency, in country, where enterprise functions;  $k_5$  – quantity of phenomena demonstrations, which form tendency, in the international level;  $t$  – time, in which tendency is studied.

Thus, two variative factors are the grounds to determine tendency spreading speed, in which industrial enterprise activity is interested. They include quantity of phenomena demonstrations, which form tendency –  $k$  and time interval –  $t$ . Both factors are not negative in their values. If only one of them is 0, it means that the phenomenon didn't take place, or there is no time interval, in which tendency is investigated. Condition of tendency spreading speed existence may be shown:

$$V > 0. \quad (5)$$

While studying tendency spreading speed for its adaptation in the innovative activity at the industrial enterprise, it is impossible to distinguish condition of the stated function optimality. It stems from the fact that the innovative activity is a complicated process to search and spread innovations. That's why there is a rule: the higher speed is better – in this case it doesn't work. In order to analyze tendencies, they are necessary to be studied together, with purpose to compare final results.

**Conclusions and directions of further researches.** Calculation of tendency spreading speed increases the objectivity to make decisions and allows to form investigated tendencies range quantitatively. Quantitative data concerning tendency spreading speed give opportunity to promote qualitative analysis into new level, decreasing the subjectivism level and using formalized methods concerning innovative development directions prognostication at the industrial enterprises.

The research of the practical tendency spreading speed use shows that there are essential differences of their innovative activity at the Ukrainian industrial enterprises. Perspectives for further investigations consist in making of approach to group tendencies due to the spreading speed factor with aim to define grounds to form innovative development directions, i.e. the key aspects which characterize observed processes and phenomena. This grouping is suggested to conduct through method of multiple research by tendency spreading speed feature, particularly on the base of cluster analysis. Its peculiarity consists in the fact that at the beginning of analysis one doesn't need to set concrete group value, which form clusters. The tendencies analysis results with hierarchical clustering method allow to make conclusions of interconnection between separate tendencies concerning their innovative activity for the industrial enterprise. Methodic mechanism to create hierarchical clustering allows to form consistent tendencies groups, which have similar peculiarities of development. Therefore tendencies inside groups will be similar between each other due to proper criteria. And at the same time tendencies which are included to different clusters, will differ from each other. Such tendency clusters give reasons to prognosticate perspective directions of the innovative development at the industrial enterprises, belonging to Ukrainian engineering sector.

1. Антонюк Л.Л. Інновації: теорія, механізм розробки та комерціалізації : монографія / Л.Л. Антонюк, А.М. Поручник, В.С. Савчук. – К. : КНЕУ, 2003. – 399 с.
2. Фатхутдинов Р.А. Инновационный менеджмент: учебник / Р.А. Фатхутдинов. – СПб. : Питер, 2003. – 400 с.

3. Кваша Т.К. Вибір пріоритетних напрямків науково-технологічного розвитку з використанням форсайту / Т.К. Кваша // Проблеми розвитку інформаційного суспільства : матеріали II міжнародного форуму. – К. : УкрІНТЕІ, 2010. – Ч. II. – С. 78-82.
4. Федулова Л.І. Форсайт: сучасна методологія технологічного прогнозування / Л.І. Федулова // Економіка і прогнозування. – 2008. – №3. – С. 106-120.
5. Ілляшенко С.М. Управління інноваційним розвитком : навчальний посібник. – 2-ге вид., перероб. і доп. – Суми: ВТД «Університетська книга»; К. : Видавничий дім «Княгиня Ольга», 2005. – 324 с.
6. Біловодська О.А. Системний аналіз і удосконалення теоретико-методологічних підходів до вибору напрямків інноваційного розвитку підприємств / О.А. Біловодська // Проблеми науки. – 2004. – №4. – С. 7-15.
7. Довбенко В.І. Вибір напрямків інноваційного розвитку підприємств за умов змін стану ринку / В.І. Довбенко // Вісник. – Львів : Видавництво Національного університету «Львівська політехніка», 2010. – №690.
8. Кузьмін О.Є. Управління інноваційним процесом на підприємствах: проблеми і шляхи їх розв'язання / О.Є. Кузьмін, С.В. Князь, Л. І. Мельник // Економічний вісник Національного технічного університету України «Київський політехнічний інститут». – 2005. – №2. – С. 371-382.
9. Рогоза М.Є. Стратегічний інноваційний розвиток підприємств: моделі та механізми : монографія / М.Є. Рогоза, К. Ю. Вергал // ВНЗ Укоопспілки «Полтав. ун-т економіки і торгівлі». – Полтава : РВВ ПУЕТ, 2011. – 136 с.
10. Шипуліна Ю.С. Сучасні підходи до інтенсифікації інноваційного розвитку промислових підприємств: теоретичний огляд / Ю. С. Шипуліна // Маркетинг і менеджмент інновацій. – 2012. – №3. – С. 128-140.
11. Одотюк І.В. Перспективні тренди інноваційного розвитку глобальної та національної економік [Електронний ресурс] / І. В. Одотюк // Електронне наукове фахове видання «Ефективна економіка». – 2010. – Режим доступу: <http://www.economy.nayka.com.ua/index.php?operation=1&iid=180>
12. П'ятницька Г.Т. Інноваційний розвиток організацій: невід'ємні складові та чинники впливу [Електронний ресурс] / Г.Т. П'ятницька // Маркетинг і менеджмент інновацій. – 2013. – №3. – с. 76-91. – Режим доступу: [http://mmi.fem.sumdu.edu.ua/sites/default/files/mmi2013\\_3\\_76\\_91.pdf](http://mmi.fem.sumdu.edu.ua/sites/default/files/mmi2013_3_76_91.pdf)
13. Чухрай Н.І. Формування інноваційного потенціалу підприємства: маркетингове та логістичне забезпечення : монографія. – Львів : Видавництво Національного університету «Львівська політехніка», 2002. – 316 с.
14. Galanakis K. Innovation process. Make sense using systems thinking / K. Galanakis // Technovation. – 2006. – №26(11). – P. 1222-1232.
15. Rogers E.M. Diffusion of Innovations fourth edition / E.M. Rogers // The Free Press, New York, 1995. – P. 25-26.
16. Kusiak A. Innovation: A Data-driven Perspective / A. Kusiak // Drug Development. – July 2007. – Touch Briefings, London, UK. – P. 55-58.
17. Rex Yuxing Du. Quantitative Trendspotting / Rex Yuxing Du, Wagner A. Kamakura // Journal of Marketing Research. – August 2012. – Vol. 49, No. 4. – P. 514-536.
18. Bañbura M. Now-casting and the real-time data flow / M. Bañbura, D. Giannone, M. Modugno, L. Reichlin // Handbook of Economic Forecasting. – 2013. – Vol. 2. – P. 195-237.
19. De Mol C. Forecasting using a large number of predictors: Is Bayesian shrinkage a valid alternative to principal components? / C. De Mol, D. Giannone, L. Reichlin // Journal of Econometrics. – October 2008. – Vol. 146, Issue 2. – P. 318-328.
20. Carriero A. Forecasting exchange rates with a large Bayesian VAR International / A. Carriero, G. Kapetanios, M. Marcellino // Journal of Forecasting. – April 2009. – Vol. 25, Issue 2. – P. 400-417.
21. Aruoba S. B. Real-time measurement of business conditions / S. B. Aruoba, F. X. Diebold, C. Scotti // Journal of Business and Economic Statistics. – 2009. – Vol. 27, Issue 4. – P. 417-427.
22. Ma J. Demand trend mining for predictive life cycle design / J. Ma, M. Kwak, H. M. Kim // Journal of Cleaner Production. – April 2014. – Vol. 68, Issue 1. – P. 189-199.



## Розділ 1 Маркетинг інновацій

23. Gunnesch-Luca G. Social norms, technology acceptance, and the moderating effect of trendsetting / G. Gunnesch-Luca, U. Klöble, A. S. Göritz, K. Moser // Zeitschrift für Arbeits- und Organisationspsychologie. – 2013. – Vol. 57, Issue 4. – P. 177-184.

24. Антонюк Л.Л. Інновації: теорія, механізм розробки та комерціалізації : монографія / Л.Л. Антонюк, А.М. Поручник, В.С. Савчук. – К. : КНЕУ, 2003. – 399 с.

25. Тренд. Словарь «Академик». [Электронный ресурс]. – Режим доступа: <http://dic.academic.ru/dic.nsf/politology/2901/%D0%A2%D1%80%D0%B5%D0%BD%D0%B4>

26. Тренд. Экономический словарь [Электронный ресурс]. – Режим доступа: <http://dictionary-economics.ru/word/%D0%A2%D1%80%D0%B5%D0%BD%D0%B4>

27. Тренд – це тенденція і напрямок розвитку [Електронний ресурс]. – Режим доступу: <http://svitohlyad.com.ua/finansy/trend-tse-tendentsiya-i-napryamok-rozvytku/>

28. Росохата А.С. Трендотчінг як інструмент визначення стратегічних напрямків розвитку в маркетингу / Н.С. Пляшенко, А.С. Росохата // Маркетинг і менеджмент інновацій. – 2011. – №1. – С. 29-35.

29. Богачов С. Форсайт як методологія проектування майбутнього / С. Богачов, О. Соловцова // Схід. Серія: Економіка. – Вересень-жовтень 2013. – №5(125). – С. 14-17.

30. Аверьянов Л.Я. Единство места, времени и действия [Электронный ресурс] / Л.Я. Аверьянов. – 2010. – Режим доступа: [http://lit.lib.ru/a/awerxjanow\\_1\\_j/text\\_0010.shtml](http://lit.lib.ru/a/awerxjanow_1_j/text_0010.shtml)

31. Зозульов О.В. Ринкове позиціонування: з чого починається створення успішних брендів / О.В. Зозульов, Н.Л. Писаренко. – К. : Знання-Прес, 2004. – 199 с.

32. Безрукова Е.Г. Прогнозирование статистических временных рядов / Е.Г. Безрукова, Е.А. Руденчик. – Ярославль : Ярославский гос. тех. университет, 1997. – 94 с.

33. Швидкість. Академічний тлумачний словник української мови в 11 томах. Т. 11. – [Електронний ресурс]. – Режим доступу: <http://sum.in.ua/s/shvydkistj>

**А.С. Росохата**, аспірант кафедри маркетингу та УІД, Сумський державний університет (м. Суми, Україна)

### **Кількісна оцінка тенденцій у системі прогнозування інноваційного розвитку промислового підприємства**

*У статті представлений підхід до прогнозування напрямків інноваційного розвитку промислових підприємств на основі дослідження актуальних тенденцій соціально-економічного розвитку, що покладений в основу напряму дослідження – трендотчінгу. Автором запропонована методика кількісної оцінки тенденцій із метою зменшення рівня суб'єктивізму в прогнозуванні напрямів розвитку підприємств, що ґрунтується на визначенні швидкості поширення тенденцій.*

Ключові слова: прогнозування, напрямок інноваційного розвитку, промислове підприємство, тенденція, трендотчінг, швидкість поширення тенденцій.

**А.С. Росохата**, аспірант кафедри маркетинга и УИД, Сумский государственный университет (г. Сумы, Украина)

### **Количественная оценка тенденций в системе прогнозирования инновационного развития промышленного предприятия**

*В статье представлен подход к прогнозированию направлений инновационного развития промышленных предприятий на основе исследования актуальных тенденций социально-экономического развития, который положен в основу направления исследования – трендотчинга. Автором предложена методика количественной оценки тенденций с целью уменьшения уровня субъективизма в прогнозировании направлений развития предприятий, основанная на определении скорости распространения тенденций.*

Ключевые слова: прогнозирование, направление инновационного развития, промышленное предприятие, тенденция, трендотчинг, скорость распространения тенденции.

1. Antoniuk, L.L., Poruchnyk, A.M., Savchuk, V.S. (2003). *Innovatsii: teoriia, mekhanizm rozrobky ta komertsializatsii [Innovation: theory, designing mechanism and commercialization]*. Kyiv: KNEU [in Ukrainian].
2. Fatkhutdinov, R.A. (2003). *Innovatsionnyj menedzhment [Innovative management]*. (4nd). Saint Petersburg: Piter [in Russian].
3. Kvasha, T.K. (2010). Vybir priorytetnykh napriamkiv naukovykh i tekhnolohichnykh rozvytku z vykorystanniam forsaitu [Selecting priority areas of scientific and technological development, using Forsyth]. *Problemy rozvytku informatsiinoho suspilstva: materialy II mizhnarodnoho forumu – Issues of Information Society: Proceedings of II International Forum*. (Vols. 2) (pp. 78-82). Kyiv: UkrINTEI [in Ukrainian].
4. Fedulova, L.I. (2008). Forsait: suchasna metodolohiia tekhnolohichnoho prohnozuvannia [Forsyth: modern methodology of technological forecasting]. *Ekonomika i prohnozuvannia – Economics and Forecasting*, 3, 106-120 [in Ukrainian].
5. Illiashenko, S.M. (2005). *Upravlinnia innovatsiynym rozvytkom [Management of innovative development]*. (2nd ed., rev.). Sumy: VTD «Universytetska knyha»; Kyiv: Vydavnychiy dim «Kniahynia Olha» [in Ukrainian].
6. Bilovodska, O.A. (2004). Systemnyi analiz i udoskonalennia teoretyko-metodolohichnykh pidkhodiv do vyboru napriamkiv innovatsiinoho rozvytku pidpriemstv [System analysis and improvement of theoretical and methodological approaches to the choice of directions of enterprises' innovative development]. *Problemy nauky – Problems of science*, 4, 7-5 [in Ukrainian].
7. Dovbenko, V.I. (2010). Vybir napriamkiv innovatsiinoho rozvytku pidpriemstv za umov zmin stanu rynku [The choice of directions of enterprises' innovative development by market conditions, changes in the state]. *Visnyk – Bulletin*. Lviv: Vydavnytstvo Natsionalnoho universytetu «Lvivska politekhnika» [in Ukrainian].
8. Kuzmin, O.Ye., Kniaz, S.V., & Melnyk, L.I. (2005). Upravlinnia innovatsiynym protsesom na pidpriemstvakh: problemy i shliakhy yikh rozviazannia [Managing the innovative process at enterprises: problems and their solutions]. *Ekonomichnyi visnyk Natsionalnoho tekhnichnoho universytetu Ukrainy «Kyivskyi politekhnichnyi instytut» – Economic Bulletin, National Technical University of Ukraine «Kyiv Polytechnic Institute»*, 2, 371-382 [in Ukrainian].
9. Rohoza, M.Ye., & Verhal, K.Yu. (2011). *Stratehichnyi innovatsiynyi rozvytok pidpriemstv: modeli ta mekhanizmy [Strategic development of innovative enterprises: models and mechanisms]*. Poltava : RVV PUET [in Ukrainian].
10. Shypulina, Yu.S. (2012). Suchasni pidkhody do intensyfikatsii innovatsiinoho rozvytku promyslovykh pidpriemstv: teoretychnyi ohliad [Current approaches to intensify of industrial enterprises' innovative development: theoretical overview]. *Marketynh i menedzhment innovatsii – Marketing and management of innovations*, 3, 128-140 [in Ukrainian].
11. Odotiuk, I.V. (2010). Perspektyvni trendy innovatsiinoho rozvytku hlobalnoi ta natsionalnoi ekonomik [Future trends innovation of the global and national economies]. *Efektivna ekonomika – Effective economy*, 4. Retrieved from <http://www.economy.nayka.com.ua/index.php?operation=1&iid=180> [in Ukrainian].
12. Piatnytska, H.T. (2013). Innovatsiynyi rozvytok orhanizatsii: nevidiemni skladovi ta chynnyky vplyvu [Innovative development of organizations: integral components and factors of influence]. *Marketynh i menedzhment innovatsii – Marketing and management of innovations*, 3, 76-91. Retrieved from [http://mmi.fem.sumdu.edu.ua/sites/default/files/mmi2013\\_3\\_76\\_91.pdf](http://mmi.fem.sumdu.edu.ua/sites/default/files/mmi2013_3_76_91.pdf) [in Ukrainian].
13. Chukhrai, N.I. (2002). *Formuvannia innovatsiinoho potentsialu pidpriemstva: marketynhove ta lohistychni zabezpechennia [Formation of the enterprises' innovative potential: marketing and logistics software]*. Lviv: Vydavnytstvo Natsionalnoho universytetu «Lvivska politekhnika» [in Ukrainian].
14. Galanakis, K. (2006). Innovation process. Make sense using systems thinking. *Technovation*, 26 (11), 1222-1232 [in English].
15. Rogers, E.M. (1995). *Diffusion of Innovations*, 25-26. The Free Press, New York.
16. Kusiak, A. (2007). Innovation: A Data-driven Perspective. *Drug Development*, 55-58. Touch Briefings, London, UK [in English].

17. Rex, Yuxing Du, & Wagner, A. Kamakura. (2012). Quantitative Trendspotting. *Journal of Marketing Research*, 49, 4, 514-536 [in English].
18. Bańbura, M., Giannone, D., Modugno, M., & Reichlin, L. (2013). Now-casting and the real-time data flow. *Handbook of Economic Forecasting*, 2, 195-237 [in English].
19. De Mol, C., Giannone, D., & Reichlin, L. (2008). Forecasting using a large number of predictors: Is Bayesian shrinkage a valid alternative to principal components? *Journal of Econometrics*, 146, 2, 318-328 [in English].
20. Carriero, A., Kapetanios, G., & Marcellino, M. (2009). Forecasting exchange rates with a large Bayesian VAR. *International Journal of Forecasting*, 25, 2, 400-417 [in English].
21. Aruoba, S. B., Diebold, F. X., & Scotti, C. (2009). Real-time measurement of business conditions. *Journal of Business and Economic Statistics*, 27, 4, 417-427 [in English].
22. Ma, J., Kwak, M., & Kim, H. M. (2014). Demand trend mining for predictive life cycle design. *Journal of Cleaner Production*, 68, 1, 189-199 [in English].
23. Gunnesch-Luca, G., Klöble, U., Görit, A. S., & Moser, K. (2013). Social norms, technology acceptance, and the moderating effect of trendsetting. *Zeitschrift für Arbeits- und Organisationspsychologie*, 57, 4, 177-184 [in English].
24. Trend. *Slovar «Akademik» – Dictionary «Akademik»*. Retrieved from <http://dic.academic.ru/dic.nsf/politology/2901/%D0%A2%D1%80%D0%B5%D0%BD%D0%B4> [in Russian].
25. Trend. *Ekonomicheskij slovar – Economic dictionary*. Retrieved from <http://dictionary-economics.ru/word/%D0%A2%D1%80%D0%B5%D0%BD%D0%B4> [in Russian].
26. Trend – tse tendentsiia i napriamok rozvytku [Trend as a trend and direction]. (n.d.). *Svitohliad – Outlook*. Retrieved from <http://svitohlyad.com.ua/finansy/trend-tse-tendentsiya-i-napryamok-rozvytku/> [in Ukrainian].
27. Illiashenko, N.S., & Rosokhata, A.S. (2011). Trendvotchinih yak instrument vyznachennia stratehichnykh napriamkiv rozvytku v marketynhu [Trendwatching as a tool for determining the strategic direction of marketing]. *Marketynh i menedzhment innovatsii – Marketing and management of innovations*, 1, 29-35 [in Ukrainian].
28. Bohachov, S., & Solovtsova, O. (2013). Forsait yak metodolohiia proektuvannia maibutnoho [Foresight as a design methodology of future]. *Skhid. Seriia: Ekonomika – East. Series: Economics*, 5(125), 14-17 [in Ukrainian].
29. Averianov, L.Ya. (2010). Edinstvo mesta, vremeni i deistviia – Unity of Location, Time and action. *lit.lib.ru*. Retrieved from [http://lit.lib.ru/a/awerxjanow\\_1\\_j/text\\_0010.shtml](http://lit.lib.ru/a/awerxjanow_1_j/text_0010.shtml) [in Russian].
30. Zozulov, O.V., & Pysarenko, N.L. (2004). *Rynkove pozytsionuvannia: z choho pochynaietsia stvorennia uspishnykh brendiv [Competitive positioning: how to begin building successful brands]*. Kyiv: Znannia-Pres [in Ukrainian].
31. Bezrukova, E.H., & Rudenchik, E.A. (1997). *Prohnozirovaniie statisticheskikh vremennykh riadov [Statistical time series forecasting]*. Yaroslavl: Yaroslavskii hos. tekhn. Universitet [in Russian].
32. Shvydkist [Speed]. *Akademichniy tlumachnyi slovnyk ukrainskoi movy v 11 tomakh – Academic Dictionary of the Ukrainian language in 11 volumes*, 11 Vols. Retrieved from <http://sum.in.ua/s/shvydkistj> [in Ukrainian].

Отримано 23.04.2014 р.