

21. Christopher, M. Logistics and Supply Chain Management [Text] / M. Christopher. – Ed. 5. – FT Press, 2016. – 328 p.
22. Hryhorenko, T. I. Kласифікація франчайзингових мереж [Text] / T. I. Hryhorenko // Товари і ринки. – 2011. – No. 1. – P. 36–43.
23. Dannikov, O. V. Problemy pobudovy ta funktsionuvannya franchaizynhovykh system v Ukraini [Text] / O. V. Dannikov // Marketynh v Ukraini. – 2008. – No. 5 (51). – P. 62–69.
24. Dmytryshyn, V. S. Dohovir komertsii noi kontsesii ta dohovir franchaizynhu. Spivvidnoshennia poniat ta pravova pryroda [Text] / V. S. Dmytryshyn // Chasopys Kyivskoho universytetu prava. – 2010. – No. 3. – P. 199–203.
25. Mazurenko, V. P. Rozvytok franchaizynhovykh vidnosyn u mizhnarodnomu biznesi [Text] / V. P. Mazurenko // Naukovyi visnyk ChDIEU. – 2013. – No. 3 (19). – P. 78–84.
26. Makhnusha, S. M. Franchaizynhova forma vykorystannia brendu: pohliad z pozytsii marketynhu innovatsii [Text] / S. M. Makhnusha // Marketynh i menedzhment innovatsii. – 2010. – No. 2. – P. 26–33.
27. Semenenko, I. M. Vykorystannia franchaizynhu v diialnosti promyslovykh pidpriemstv [Text] / I. M. Semenenko // Biznes Inform. – 2012. – No. 7. – P. 102–104.
28. Cherenkov, V. I. Evoliutsiia marketingovoi teorii i transformatsiia dominiruiushchei paradigmy marketinga [Text] / V. I. Cherenkov // Vestnik Sankt-Peterburgskogo universiteta. – 2004. – No. 2 (16). – P. 3–32.
29. Lisun, Y. V. Teoretyko-metodolohichni zasady formuvannia zbalansovanoho stratehichnogo potentsialu partnerskoi vzaiemodii pidpriemstv sfery posluh [Text] / Y. V. Lisun // Naukovyi visnyk Khersonskoho derzhavnoho universytetu. – 2014. – Vol. 6, No. 3. – P. 12–15.
30. Lisun, Y. V. Teoretychni aspekty formuvannia vzaiemovidnosyn u kontseptsiiakh marketynhu [Text] / Y. V. Lisun // Visnyk Odeskoho natsionalnoho universytetu im. I. I. Mechnykova. – 2015. – No. 2/1 (20). – P. 70–73.
31. Lisun, Y. V. Uzgodzhennia sotsialno-ekonomichnykh interesiv pidpriemstv na osnovi refleksyvnoho pidkhodu [Text] / Y. V. Lisun // Visnyk Khmelnytskoho natsionalnoho universytetu. – 2015. – Vol. 4, No. 4. – P. 27–32.
32. Zhuk, I. M. Statystychnyi shchorichnyk Ukrainy za 2015 r. [Text] / ed. by I. M. Zhuk. – State Statistics Service of Ukraine, 2016. – 575 p.
33. Franchise Group [Electronic resource]. – Available at: \www/URL: <http://franchisegroup.com.ua/>
34. Lisun, Y. V. Statystychnyi analiz franchaizynhu sfery hromadskoho kharchuvannia ta torhivli v Ukraini [Text] / Y. V. Lisun // Ekonomichnyi analiz. – 2015. – No. 20. – P. 45–52.
35. Haivanovych, N. V. Merezhevi struktury malikh i serednikh pidpriemstv [Text] / N. V. Haivanovych // Visnyk Khmelnytskoho natsionalnoho universytetu. Ekonomichni nauky. – 2011. – Vol. 6, No. 4 (181). – P. 110–115.
36. Lisun, Y. V. Lohistychni systemy u zabezpechenni partnerskoi vzaiemodii pidpriemstv [Text]: Collection of scientific articles / Y. V. Lisun // Actual problems of globalization. – 2016. – P. 195–199.
37. Lisun, Y. V. Stages and technology in developing a strategic partnership [Text]: Collection of scientific articles / Y. V. Lisun // Perspective economic and management issues. – Vienna: «East West» Association For Advanced Studies and Higher Education GmbH, 2015. – P. 449–453.
38. Lisun, Y. V. Aktyvizatsiia partnerstva na osnovi klasterneho pidkhodu yak mekhanizmu rehionalnoho rozvytku biznesu v Ukraini [Text]: Monograph / Y. V. Lisun // Spatial aspects of socio-economic systems development: the economy, education, and health care. – Opole: The Academy of Management and Administration in Opole, 2015. – P. 76–82.
39. Lisun, Y. V. Management contractors interests based on network model of economic development [Text]: Collection of scientific articles / Y. V. Lisun // Institutional framework for the functioning of the economy in the context of transformation. – 2015. – P. 292–297.

ИССЛЕДОВАНИЕ МАРКЕТИНГА ВЗАИМОДЕЙСТВИЯ В ФРАНЧАЙЗИНГОВОЙ ДЕЯТЕЛЬНОСТИ ТОРГОВЫХ ПРЕДПРИЯТИЙ

В работе автором уточнена сущность и составляющие понятия «маркетинг отношений», «маркетинг взаимодействия», «партнерство» в торговом предпринимательстве. Исследована сущность термина «дистрибуция» и «франчайзинг» и определено место франчайзинга в структуре организационно-правовых форм дистрибьюторских систем. Обобщены сильные и слабые стороны франчайзинговой деятельности с использованием SWOT-анализа.

Ключевые слова: предпринимательство, торговля, дистрибуция, партнеры, франчайзинг, маркетинг взаимодействия, согласования интересов, эффективность, устойчивое развитие.

Lisun Yanina, PhD, Associate Professor, Department of marketing and advertising, Kyiv National University of Trade and Economics, Ukraine, e-mail: yanakw@ukr.net, ORCID: <http://orcid.org/0000-0002-5250-2809>

UDC 65.011

DOI: 10.15587/2312-8372.2017.108794

Kolos I.

MATERIAL FLOW MANAGEMENT OF INDUSTRIAL ENTERPRISE ON LEAN PRINCIPLES

Охарактеризовано матеріальний потік як складник потоку створення цінності, де відбувається зміна матеріально-речової форми виробничих запасів до готового виробу з одночасним створенням цінності для споживача. Запропоновано модель управління матеріальним потоком промислового підприємства на засадах ощадливості з використанням процесного, функціонального та системного підходів. Розкрито доречність використання сукупності методів ощадливого виробництва в реалізації окремих функцій управління матеріальним потоком промислового підприємства з орієнтацією на безперервне вдосконалення створення цінності для споживача.

Ключові слова: потік створення цінності, матеріальний потік, управління матеріальним потоком, ощадливе виробництво, промислове підприємство.

1. Introduction

In today's conditions, the necessary component of the production process is the availability of a sufficient number

of appropriate quality of production stocks. Priority direction of increasing the efficiency of industrial enterprises is the proper provision of value to consumers of finished products. The main objective of the industrial enterprise is

ensuring the welfare of owners, cash generation and prevention of negative results of work that is achieved primarily through effective material flow management, as well as reducing unproductive costs/waste in the procurement and storage of industrial stocks, storage and sale of finished products. Improvement of management of internal processes of the enterprise, taking into account the current state of development of the market and the sector of the national economy, internal resources and potential opportunities is of particular importance. Generalization, systematization and justification of methodological features of effective material flow management of an industrial enterprise in the context of providing value to the consumer become topical.

2. The object of research and its technological audit

The object of research is the material flow management of an industrial enterprise as a component of the flow of value creation within the introduction of the concept of lean production.

It should be noted that the value for the consumer is formed as a result of a certain set of activities of the manufacturing enterprise, in particular the greater part in the balanced flow of processing the production stocks (raw materials and materials) through work in progress and semi-finished products of its own production to finished products.

It should be noted that it is expedient to systematize all actions that consume resources and require costs, from the standpoint of readiness for them to pay the consumer to groups: (1) value-added to the finished product; (2) non-value-added to the finished product and are not necessary for the organization and production technology (unproductive waste) (3) required non-value-added to ensure the normal operation of production [1–3]. To reduce waste, it is appropriate to consider the feasibility of implementing lean production methods, including the use of their integration.

The author in previous scientific works established a set of the most recognized and common methods of lean production [4, 5], and also the combination in various combinations of some methods for the effective material flow management of an industrial enterprise is reasonably [5].

3. The aim and objectives of research

The aim of research is development of theoretical and methodological approaches to material flow management of an industrial enterprise in the context of lean transformations.

Achieving this aim has made it necessary to solve the following scientific problems:

1. To reveal the material flow as a component of the value stream for the end user.
2. To substantiate an ordered set of methods of lean production in the material flow management of an industrial enterprise.
3. To prove the expediency of a combination of methods for ensuring rational material flow management from the point of view of the effective functioning of an industrial enterprise in the lean context.

4. Research of existing solutions of the problem

A critical analysis of the published works of scientists on the outlined problems allows to establish the basis for the study:

- the concept of lean production is one of the dominant in the management of an industrial enterprise in the current conditions of management [1, 3, 6, 7];
- the company's activities are focused on creating value for the end user [6, 8];
- material flow management is a priority for industrial enterprises in achieving the goal of lean production [1, 3, 9];
- the key element is waste to overproduction, wait time, transportation, processing, inventory, motion, defects [6], which it is advisable to minimize and, if possible, eliminate/liquidate;
- the systematization of waste by their types and presentation in the form of a mini glossary of the terminology of the lean production concept [10, 11], a mini guide to the implementation of lean production techniques [12].

Recognizing the importance of the obtained scientific results, certain theoretical and methodological problems of rational material flow management of an industrial enterprise to create value for the consumer remain the subject of discussions and require further research. In published works, the material flow management in the concept of lean production for providing value to the consumer is not sufficiently investigated, the urgency of this problem and the need for this study are determined.

5. Methods of research

Specific scientific results are obtained using general and special methods of researching processes and phenomena in their interrelations and development, namely: system analysis – to establish the basic approaches to material flow management of an industrial enterprise; graphical method – to represent the model of material flow management of an industrial enterprise on the lean basis; synthesis, induction, deduction – to justify the expediency of using lean production methods within the framework of individual material flow management functions; structural and logical analysis, groupings, system method – for selection of key performance indicators in material flow management.

6. Research results

The flow of value stream (all actions without exception, as a result of which the product passes through all stages and processes – from developing its concept to launching into production and from accepting the order for the product before delivery to the customer [8]) is viewed as the main object of management in the lean production concept. The most difficult and important problem is the allocation of value streams for a single product or for a group of products within an enterprise. This is explained, first of all, by focusing on increasing the value of the product from the position of the customer; the focus of attention of top management on identifying unproductive costs and excluding actions/operations that create them. For industrial enterprises, the material flow becomes important as a component of the value stream with qualitative

and quantitative characteristics. It is a sufficient material flow that ensures the normal functioning of an industrial enterprise. This encourages top management to effectively manage the material flow. As part of the study, a model is proposed for material flow management of an industrial enterprise based on lean principles (Fig. 1).

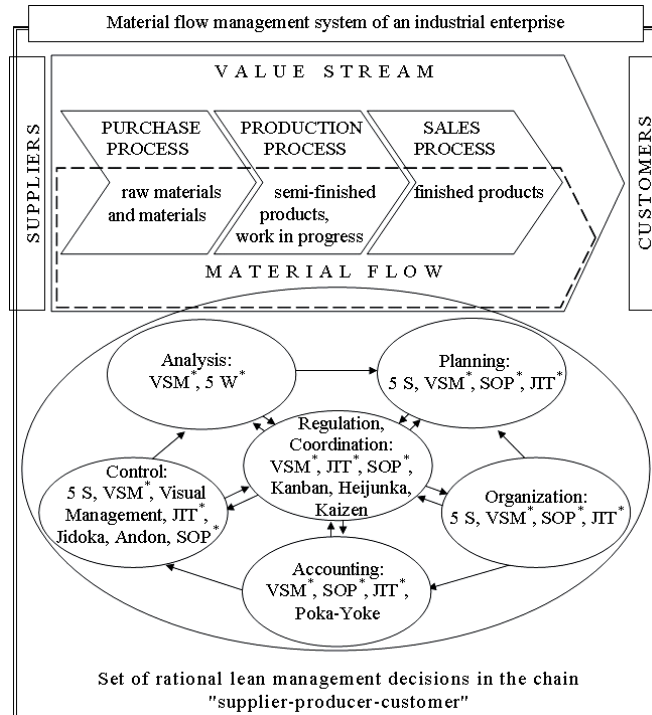


Fig. 1. The model of material flow management system of an industrial enterprise on the lean basis. Note: author's own development.

Note: VSM (Value Stream Mapping), 5 W (Five Whys), SOP (Standard Operating Procedure), JIT (Just-in-Time)

The target basis for material flow management in providing value to the end user is appropriate to determine:

- quantity is related to the efficiency and throughput of technological equipment for converting raw materials and materials into finished products from the first presentation to the consumer;
- quality – sufficiency is ensured by the basic characteristics of the final product, for which customers and end users are willing to pay;
- time – reduction of the production cycle duration, which is consistent with the production program and the established requirements of internal regulations for duration of the technological process.

The main objective of material flow management of an industrial enterprise on the lean basis is creation of a greater value with less effort, with a focus on continuous improvement, provided that there is a targeted reduction in unproductive expenses (waste).

As part of research, the material flow of an industrial enterprise in the context of lean production should be viewed from the viewpoint of the process approach as a set of interrelated processes:

- the process of purchase/supply is aimed at the implementation of individual transactions within the value stream to create a material flow in the form of raw materials and materials (main and auxiliary);

- the process of production/processing provides for the manufacturer to perform certain operations of the technological process, quality assurance procedures, arrangements for the organization, maintenance and administration of production within the value stream by utilizing the limited resources and intelligence of the staff. The material flow is in the form of a flow of unfinished production at various stages of processing with a different degree of readiness of products and semi-finished products of own production;
- the process of sales/consumption ensures the confirmation/evaluation of the received necessary value by the consumer in the best way for him. Material flow in the form of a stream of finished products intended for use/consumption by the customer.

From the point of view of the systemic approach of creating value for the consumer, it is expedient to consider through the material flow management as a system, realized by establishing a set of rational specific lean methods for performing these processes. To comply with this, owners and top management of the manufacturing company need to revise the value stream daily, with a focus on the future well-being of key stakeholders: suppliers and consumers. As a consequence, in the chain «supplier-producer-customer» joint lean management decisions are made.

It should be noted that effective management of material flow in the lean context provides for a consistent mutually agreed rationale for lean production functions and methods within an individual function. Under such conditions, continuous improvement of the value creation for the consumer is ensured. Thus, the implementation of the analysis function involves identification of waste in the material flow, establishing the causes of their occurrence and justifying the ways of reducing/eliminating/preventing by introducing the VSM, 5 W [8, 10–14].

It can be argued that the construction of a value stream map in the context of the material flow (current-state map, future-state map, ideal-state map [8, 10–13, 15]) helps overcome, above all, the problem of identifying waste in the material flow and continuous improvement work to minimize them. The presence of cards helps to distribute operations in the material flow within the allocated processes into two groups (create value for the consumer/do not create value for the consumer), helps to establish unproductive expenses and operations/hidden waste, and also substantiates a plan for modernization and improvement. A careful study of the cause-and-effect patterns of the occurrence of waste and the development of possible management solutions to overcome typical problems and non-standard situations is provided by the 5 W.

Rational planning and organization of the material flow in the concept of lean production should be considered as a basis for the formation of (1) necessary and sufficient value for the consumer; (2) reliable and sufficient information on the results of the conversion from raw materials to the finished product and the improvement on an ongoing basis of concerted actions with suppliers and customers. Correct execution of planning and organizing functions ensures the application of 5S, VSM, SOP, JIT [8, 10–13, 15]. 5S contributes to improving the performance of operations of the process and safe working conditions, reducing accidental errors/hidden

waste and rejection. The application of JIT provides for the identification of a model to justify the optimal stock in the places of storage of raw materials and materials of the proper quality and the optimal order size from suppliers. Implementation of JIT allows to predict the stability of the use of reserves, the predictability of fluctuations in the level of consumption of stocks depending on the needs of production, timeliness and accuracy in forecasting changes in the production need in the enterprise. SOP by developing and approving internal standards, including value stream maps, improves the quality of work performance within a single workplace, a functional unit or a dedicated management entity, or an enterprise as a whole.

The success of the accounting function depends on the implementation of the VSM, SOP, JIT, Poka-Yoke [8, 10–13, 15]. The SOP method by implementing internal regulations, one of which is a value stream map, in everyday practice allows identifying problems, streamlining the activities of an individual specialist, a structural unit and an industrial enterprise as a whole. Using the JIT, top management should assess the possible costs due to a lack of certain types of materials or excess of their use, which may be caused by inaccuracies in calculating the necessary quantity of stocks in accordance with the consumption needs in the production process, which is provided by the application of management accounting of the ABC analysis, XYZ analysis. Poka-Yoke contributes to the prevention of errors in material flow, excessive reserves and the risk of freezing working capital.

The effectiveness of monitoring the obtained results is facilitated by the use of 5S, VSM, Visual Management, JIT, Jidoka, Andon, SOP [8, 10–13, 15]. To ensure operational control by Visual Management and Andon, there is a need to justify key performance indicators in three levels [16]: (1) the performance indicators of the workplace; (2) the effectiveness indicators of the value stream; (3) the performance indicators of the enterprise as a whole. The use of such key performance indicators in the material flow management is suggested: average days-in-inventory (days), level of reliability of suppliers (%), number of permanent suppliers (units), the level of attracting new suppliers (%), level of vendor loyalty (%), age of accounts payable (days), average duration of the development of a new product (days), average duration of preparation for the launch of a new product in production (days), average duration of the technological process work hours (hours), average cost and unit cost of production (UAH), material consumption of products (UAH/UAH), material output (UAH/UAH), profit level per UAH of material costs (%), average duration of flow reconfiguration (hours), percentage of rejections for certain types of products (%), cost of rejection repairing (UAH), average duration of one order (hours), average days' sales uncollected (days), working capital DAYS (day). Controlling the normal course of the production process with a focus on the quality of each operation to prevent defects is provided by Jidoka and VSM. Implementation of 5S+JIT+SOP involves determining the frequency of inspections of stock levels, affect the time and volume of the order.

The result of regulatory and coordination functions is fully achieved through compliance with the VSM, JIT, SOP, Kanban, Heijunka, Kaizen [7, 8, 10–15]. Implementation of corrective measures in the material flow is car-

ried out by (1) reviewing and refining the future-state map on the formation of an ideal-state map – VSM; (2) ensuring minimum waste and equalization of production volumes – Heijunka; (3) synchronization of the production process with collateral and the consumption process – JIT+Kanban. SOP contributes to the continuous improvement of professional skills, and Kaizen – to develop proposals for improvement of the management of material flow on an ongoing basis.

7. SWOT analysis of research results

Strengths. The strength of research is the further development of the lean management methodology in the form of a proposed model of material flow management by an industrial enterprise on the lean basis, which provides a comprehensive approach to the rationale for rational management decisions in the «supplier-producer-customer» chain.

Weaknesses. The weak side is the limitedness of a sufficient set of initial data to perform the necessary amount of applied confirmation of theoretical and methodological provisions for material flow management of an industrial enterprise in all aspects of activity with a focus on reducing waste.

Opportunities. Opportunities for further research should not be limited to justified methods (combining methods) of lean production in material flow management of an industrial enterprise to create the value of a finished product. Further substantiated implementation of lean production methods with an orientation to the effectiveness of the information flow management of value creation will provide further development of the theory and practice of lean management of an industrial enterprise.

Threats. Threats to the research results are (1) the complexity of obtaining sufficient and reliable information, which makes it difficult to assess qualitatively and objectively the implementation of lean production methods in the material flow (2) the underestimation by top management of the importance of material flow management of an industrial enterprise to create value from the consumer's perspective, will predetermine future waste.

8. Conclusions

1. The conducted research allows to characterize a material stream as a component of a value creation stream where there is a change of a material form of raw materials and materials through a work in progress to a finished product with simultaneous value creation for the consumer. The target basis for material flow management in providing value to the end user is established: quantity, quality, time.

The solution of the problem of material flow management with the use of the process approach (based on the set of coordinated interrelated processes), the system approach and the functional approach (using specific lean methods within an individual control function) is proposed to ensure lean transformations in the material flow.

2. The relevance of the use of a combination of methods of lean production in the implementation of individual functions of material flow management of an industrial enterprise with an orientation toward continuous im-

provement of the creation of value for the consumer is disclosed.

3. The combination of lean methods in various combinations has been further developed to successfully perform the functions of efficient material flow management of an industrial enterprise in the context of implementing the concept of lean production.

References

1. Carreira, B. Lean Manufacturing That Works: Powerful Tools for Dramatically Reducing Waste and Maximizing Profits [Text] / B. Carreira. – AMACOM, American Management Association, 2005. – 304 p.
2. Martin, J. W. Operational Excellence: Using Lean Six Sigma to Translate Customer Value through Global Supply Chains [Text] / J. W. Martin. – Boca Raton: Auerbach Publications, CRC Press, 2008. – 662 p. doi:10.1201/9781420062519
3. Womack, J. P. Lean Thinking. Banish waste and create wealth in your corporation [Text] / J. P. Womack, D. T. Jones. – FREE PRESS A Division of Simon & Schuster, Inc., 2003. – 402 p.
4. Kolos, I. V. Naukovo-metodychni pidkhody do typolohii metodiv oshchadlyvoho vyrobnytstva [Text] / I. V. Kolos // Naukovyi visnyk Mizhnarodnoho humanitarnoho universytetu. Seriya: «Ekonomika i menedzhment». – 2017. – Vol. 25, No. 1. – P. 121–124.
5. Kolos, I. V. Integration on effective management of industrial enterprises on lean principles [Text] / I. V. Kolos // Technology Audit and Production Reserves. – 2017. – Vol. 4, No. 4 (36). – P. 28–33. doi:10.15587/2312-8372.2017.108795
6. Ono, T. Proizvodstvennaya sistema Toyoty. Ukhodya ot massovogo proizvodstva [Text] / T. Ono. – Moscow: Institut kompleksnykh strategicheskikh issledovaniy, 2008. – 208 p.
7. Hobbs, D. P. Vnedrenie berezhlivogo proizvodstva [Text] / D. P. Hobbs; ed. by D. V. Sereda. – Minsk: Grevtsov Publisher, 2007. – 352 p.
8. Omelianenko, T. V. Oshchadlyve vyrobnytstvo: kontseptsii, instrumenty, dosvid [Text] / T. V. Omelianenko, O. V. Shcherbyna, D. O. Barabas, A. V. Vakulenko. – Kyiv: KNEU, 2009. – 157 p.
9. Feld, W. M. Lean manufacturing: Tools, Techniques, and How To Use Them [Text] / W. M. Feld. – CRC Press Series on Resource Management, 2001. – 245 p. doi:10.1201/9781420025538
10. Dailey, K. W. The Lean Manufacturing Pocket Handbook [Text] / K. W. Dailey. – Summertown: Publishing Co., 2003. – 42 p.
11. Marchwinski, C. Lean Lexicon A Graphical Glossary for Lean Thinkers [Text] / ed. by C. Marchwinski, J. Shook, A. Schroeder. – Cambridge: Lean Enterprise Institute, 2008. – 136 p.
12. Veyder, M. Instrumenty berezhlivogo proizvodstva: Mini-rukovodstvo po vnedreniyu metodik berezhlivogo proizvodstva [Text] / M. Veyder. – Moscow: Al'pina Publisher, 2011. – 125 p.
13. Hines, P. Staying Lean: Thriving, Not Just Surviving [Text] / P. Hines, P. Found, G. Griffiths, R. Harrison. – CRC Press, 2011. – 275 p. doi:10.1201/b10492
14. Womack, J. P. Lean Thinking: Banish Waste and Create Wealth in Your Corporation, Revised and Updated [Text] / J. P. Womack, D. T. Jones. – Ed. 2. – Productivity Press, 2003. – 396 p.
15. Locher, D. A. Value Stream Mapping for Lean Development: A How-To Guide for Streamlining Time to Market [Text] / D. A. Locher. – CRC Press, 2008. – 144 p.
16. Maskell, B. H. Practical Lean Accounting: A Proven System for Measuring and Managing the Lean Enterprise, Second Edition [Text] / B. H. Maskell, B. Baggaley, L. Grasso. – Productivity Press, 2013. – 475 p.

УПРАВЛЕНИЕ МАТЕРИАЛЬНЫМ ПОТОКОМ ПРОМЫШЛЕННОГО ПРЕДПРИЯТИЯ НА ПРИНЦИПАХ БЕРЕЖЛИВОСТИ

Охарактеризован материальный поток как элемент потока создания ценности, где происходит изменение материально-вещественной формы производственных запасов до готового изделия с одновременным созданием ценности для потребителя. Предложена модель управления материальным потоком промышленного предприятия на основе бережливости с использованием процессного, функционального и системного подходов. Раскрыта уместность использования совокупности методов бережливого производства в реализации отдельных функций управления материальным потоком промышленного предприятия с ориентацией на непрерывное совершенствование создания ценности для потребителя.

Ключевые слова: поток создания ценности, материальный поток, управление материальным потоком, бережливое производство, промышленное предприятие.

Kolos Iryna, PhD, Associate Professor, Certified Accounting Practitioner, Department of Accounting And Auditing, National University of Food Technologies, Kyiv, Ukraine, e-mail: irynakolos2016@gmail.com, ORCID: <http://orcid.org/0000-0001-7134-1441>