

ФОРМУВАННЯ МОДЕЛІ УПРАВЛІННЯ В ПРОМИСЛОВИХ ПАРТНЕРСТВАХ МАШИНОБУДІВНОГО КОМПЛЕКСУ УКРАЇНИ

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Проаналізовано етапи становлення та розвитку процесів формування індустриальних мереж, технологічних та логістичних ланцюгів, партнерств та їхніх різновидів. Виявлено чинники, які зумовлюють темпи і масштаб процесів створення партнерств у машинобудівному комплексі України. Окреслено та проаналізовано групу чинників, які зумовлюють створення вертикальних партнерств на засадах Partner Relationship Management (PRM) у гірничому машинобудуванні та видобувної промисловості. Обґрунтовано, що функції планованої організації взаємодії підприємств доцільно здійснювати одному з учасників партнерства. Доведено, що вибір підприємства – інтегратора зумовлює найбільший ступінь впливу одного підприємства на інших. Розроблено методику розрахунку домінантного підприємства за цією ознакою.

Ключові слова: машинобудування, партнерство, підприємство-інтегратор.

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FORMING THE MANAGEMENT MODEL IN INDUSTRIAL PARTNERSHIPS OF THE MACHINE-BUILDING COMPLEX OF UKRAINE

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Stages of development the processes of forming the industrial networks, technological and logistic chains, partnership and their varieties are analyzed. Factors that determine the rate and scale of the process of forming the partnerships in the machine-building complex of Ukraine are established. A group of the factors that lead to forming the vertical partnership based on Partner Relationship Management (PRM) in mining machinery and mining industry are determined and analyzed. It is possible to draw a conclusion that today partnership as a form of interaction between enterprises of internal machine-building complex is the most rational form in the current Ukrainian market conditions. The sustainability of cooperation and also establishment of supply conditions before production, reduction of production cycles and, as a result, more effective response to needs of consumers allows to reduce the cost of interaction. It is proved that one of the participants of the partnership should carry out the functions of the organized interaction between enterprises. It is highlighted that the election of the company – integrator is caused by the highest degree of influence of one enterprise on other. The primary problem which should be solved during forming the partnership is management of relationship between participants. The method of calculation of the dominant company by this criterion is developed.

Key words: machinery, partnership, company-integrator.

Statement of the problem. Interaction between enterprises needs the forming and regulation of relations between them which can be carried out in various organizational – legal forms. Over the past

decade the change of these forms in the Ukrainian industry in connection with transformation of market requirements is observed. These transformations have both objective reasons (for example, features of industry development, product type) and subjective. Today in Ukraine there are several kinds of processes regarding the integration and disintegration of enterprises. Firstly, there is the continuing process of forming large enterprises integration structures in industry such as corporations. It obviously will intensify further due to the implementation of large state-owned enterprises privatization program by demutualization [1]. Secondly, forming the competitive environment has led to borrowing the western experience of creation new organizational structures by the Ukrainian enterprises which differ on separate industries. The process of organizational structures reorganization at the level of medium and small business is developing on the basis of growth of subject specialization which is more shown in the last two years. So the number of small and medium enterprises according to the state statistics for 2013–2015 has increased almost by 18 %, while the number of large enterprises has decreased by 10 % [2]. It is also connected with the fact that production in the conditions of the changing demand should be flexible. A striking example of this is the deconcentrating of complicated complex of the machine-building enterprises, consisting of a large number of technological elements of the main, auxiliary and service productions. They deconcentrate by the forming small and medium-sized enterprises, serving the main production, including supply of components and consumable materials.

Due to allocation of small and medium enterprises from large corporations, Ukrainian machine-building enterprises had an opportunity to become stronger in the market by reorientation to serve not only production cycles of the one enterprise, but other enterprises in the industry. This tendency becomes particular important today in connection with individualization of the consumer demand in the industrial market that means not only an increase the range and assortment of goods, but also decrease the degree of production seriation.

Based on stated it is possible to draw a conclusion that today partnership as a form of interaction between enterprises of internal machine-building complex is the most rational form in the current Ukrainian market conditions. The sustainability of cooperation and also establishment of supply conditions before production, reduction of production cycles and, as a result, more effective response to needs of consumers allows to reduce the cost of interaction. Autonomy of participants allows to focus resources on the development of key enterprise competencies and to adapt flexibly to changing market conditions by distributing the relevant benefits and risks between participants. In such conditions, the primary problem which should be solved during forming the partnership is management of relationship between participants.

Analysis of recent publications and studies. A large number of scientists of foreign and domestic scientific schools (R. Coase, D. Nord, O. Williamson, R. Greenberg, G. Kleyner, D. Lvov, V. Stadnik, M. Yokhna, G. Sokolyuk, M. Kizim and other economists) investigate the institutional theory of firms which forms a conceptual basis of the analysis of business integration processes. (R. Coase, D. Nord, O. Williamson, R. Greenberg, G. Kleyner, D. Lvov, V. Stadnik, M. Yokhna, G. Sokolyuk, M. Kizim and other economists).

Over the past three decades the vast amount of research according to problems of forming industrial networks, technological, supply and value chains, partnerships and its forms is conducted (E. Yordon, M. Christopher, T. Gallin and M. Hendon, B. Borys and D. Jemison, M. Garret and P. Dyusyuzh, E. Krikavsky, N. Chukhray).

Partnership as a kind of interaction between enterprises can take many forms [3]. For a machine-building complex orientation of enterprises on the vertically integrated relationships with partners (consumers, commodity distribution structures and suppliers of raw materials, components, service and so on) is typical. It is caused by close cooperation and features of forming the technological chain [4]. Therefore, according to the intended objective, let's consider in more detail forming the vertical partnership which is realized due to integration of supply channel members.

Reasons of active development of partnership in supply channels are established by many scientists [5, 6]. Enterprises that are at different levels of the channel try to achieve synergy effect by connecting processes occurring in them with the processes of other channel members. Due to this the sum of collective effect is greater than the sum of separate parts.

Most of foreign and domestic scientists consider management in vertical partnership in the context of the supply channel management theory [5–10]. For designation more cooperative and coordinate approach to supply channel management the concept of Supply Chain Management (SCM) is applied. Fundamental research of this concept has been carried out by Institute of logistics and transport (UK) [9]. They have established key distinctions of SCM from traditional logistics that consist in the strategic and integrated nature of supply management as common system rather than a series of fragmented elements, such as supply, production, distribution, etc. Suppliers and end consumers are included in planning process. It allows providing effective management of supply chains based on the balancing of the integrated product flow through a chain.

Today scientists allocate two main approaches of supply channel management. The first approach considers management from the sight of the producer that is “from top to down” where the market is viewed through the channel. The second – considers from the sight of final commodity distribution structure that is “from bottom-up”.

Domestic scientists investigate problems of supply channel management mainly from the position of the theory of logistics [7, 8]. Therefore, interaction between enterprises is investigated from a position of coordination of logistic processes which makes it possible to optimize supply chain management.

In the last two decades a new relationship management concept in vertical partnership – Partner Relationship Management (PRM) has appeared [11]. This concept considers not only the importance of strategy and structure of the channel but also processes of behavioral interaction between partners. According to this concept, relationship management with partners means understanding needs of its business partners and their satisfaction as far as possible and also forming behavioral characteristics of interaction, such as trust between the members.

So, PRM concept takes into account the multidimensional nature of interaction between enterprises, not only in terms of management of integrated movement of materials, products and relevant information, but also a better understanding of changing needs, operating conditions of channel participants and their strategic influence on the entire supply chain.

Forming the management model of vertical partnerships of a machine-building complex of Ukraine within the supply channel requires a methodological basis, taking into account the sectoral features of the enterprise and the development of appropriate management tools.

Goals of the article. The purpose of this article is to develop a methodological approach and substantiate relation management tools in vertical partnership of the machine-building complex of Ukraine.

The main material of research. Each kind of industrial goods has its own specifics which determine principles of relationship management. Machine – building complex is inherently rather branched industrial complex. Type of production (dimensional and industry) and organizational structures of the machine-building industry are characterized by the close interdependence for ensuring production and functioning of enterprises. Due to the fact that machine-building complex of Ukraine is a set of specialized subindustries, depending on the type of product and the sphere of its application, it traditionally unites in several main subindustries (see fig. 1).

Partnership as a form of interaction between enterprises is the most characteristic for more high-tech and competitive subsectors of the machine-building complex of Ukraine, producing electrical, electronic, optical equipment and vehicles [13, 14].

Partnerships with the foreign companies, with equity of foreign investments or without it, are the most widespread. It occurs today due to the participation of Ukraine in the global organization CEFTA which provides standardization, certification of products at the level of international standards. The cooperation is carried out mainly in the form of vertical and horizontal partnerships. A typical example of the vertical partnership is engines production by JSC “Motor Sich” for the French corporation Iveco. “Sferos-Elektron” is Ukrainian-German vertical partnership within production of automobile heaters and conditioners for automobile and trucks, agricultural, military and special machinery. This partnership includes not only the interaction of the Ukrainian manufacturer of components with the German equipment manufacturers, but also a partnership with suppliers of raw materials that forming the integrated channel “supply – production – sales”.

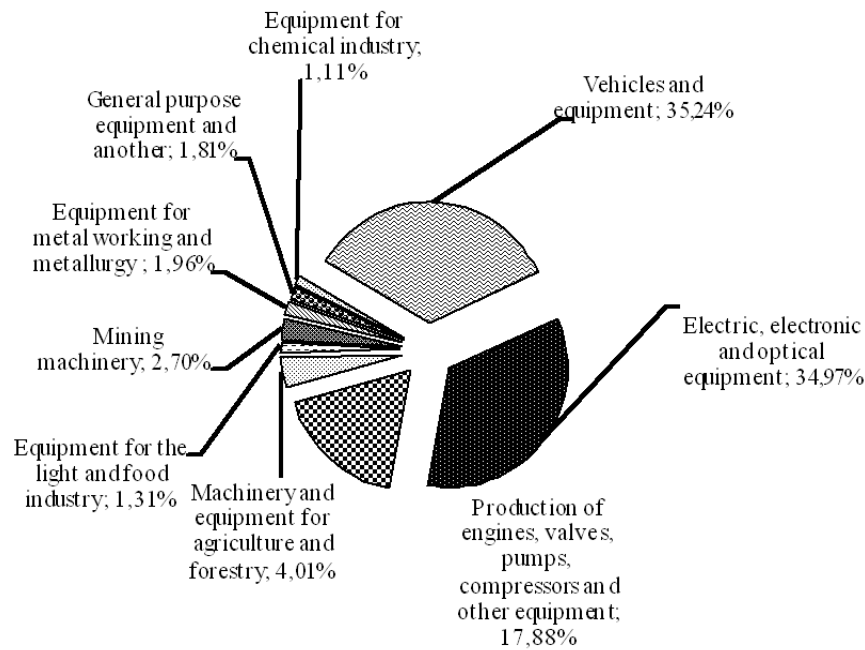


Fig. 1. The structure of the machine-building complex in terms of sales, 2014
 Source: calculated and compiled by the authors according to [12]

A typical example of a horizontal partnership is an activity of the Ukrainian company “Twist Engineering”, which produces high-precision and complicated products under the custom order. Its partners are well-known manufacturers of the equipment and tools: SNK (Japan), Juaristi (Spain), Doosan (South Korea), Vargus (Israel), SwissTools (Switzerland). “Twist Engineering” carries out function of a link between the manufacturer and customer's tasks that based on the association of the partners delegated powers.

The carried-out analysis of such historically important for Ukraine sub-sector as mining engineering machinery has shown the absence of such form of interaction between enterprises as partnership. At the same time specific of interrelations between the enterprises of the subsector as well as with enterprises related subsectors, objectively induces to forming this type of relationship. This subsector differs from all others in more difficult completing of production that assumes not only dependence of producers of end machine-building products on suppliers of component parts, consumable materials, services, etc., but also directly from requests of the end consumer – mining enterprises. It occurs because these enterprises belong to different subsectors of mining industry which significantly differs in geological conditions of raw materials extraction. It is the main differentiation factor of the product demand of machine-building complex. The most typical manifestation of this is the supply of machine-building enterprise of component parts and consumable tools for drilling rocks.

Today in Ukraine the steady tendency of mining growth which is differentiated by individual subsectors of mining industry is observed [15]. Production of mining machines and the equipment for the same period of time rapidly fell due to a number of objective and subjective reasons [4]. The lack of the park of machines and equipment was compensated for by the import. Providing the imported equipment by components and consumable materials has the certain difficulties connected, first of all, with the high price of them and its service. Therefore, today the mining companies exploiting imported equipment were reoriented on import substitution. Domestic enterprises that produce components and consumable tools began to provide not only the domestic equipment but also imported. In these circumstances providing with components and consumable materials and also after-sales service represents process of satisfaction the individualized demand.

It requires forming the integrated production and supply management system as a single system rather than as a certain number of individual elements of the logistic chain. Moreover, as well as end-users and suppliers of material resources for the production of components involved in the management process, supply channel structure becomes difficult branched system based on subject specialization. This situation

requires not only the understanding of the partners needs, but also accounting of multidimensional cooperation, including behavioral, between all participants. Managing of such channel becomes not just a management of the integrated movement of materials, products and information, but also a management of requirements of all business partners from a supplier of materials to the final consumer in order to achieve a common goal. The need for the coordinated process management mechanism of interaction requires application of the Partner Relationship Management (PRM) concept. It provides flexible management of vertical partnerships in order to respond quickly to changes of customer demand throughout the supply chain. At the same time need of preserving independence of participants of vertical partnership in case of achievement the common goal requires the coordinated mechanism of interaction process management. This mechanism is not only proportional distribution of commitments, targets and local goals of each participant, as well as results of partnership activities: benefits and costs.

All investigators emphasize the complexity of the managing vertical partnership, which is a natural consequence of the interorganizational structure which leads to forming the strategy and structure, selection and motivation of participants, coordination of the channel structure and assessment of its work [6]. If the functions of the systematic organization of the relationship carry out on the basis of integrated technological chain, the coordination of activities it is reasonable to delegate to one of the channel members. This decision is capable to provide steady cooperation in case of autonomy of enterprises - participants.

The main functions which should be carried out by the company-integrator is not only to identify the needs of each member of the vertical partnership, but also to ensure the selection of the most effective channel members on a competitive basis, the establishment of the detailed conditions of supply, management of supply, sales, information and financial flows, as well as realization of the general situational analysis. The higher the impact of the individual participant on contractual relations in the partnership, the greater its opportunities to provide the implementation of integrator functions because it has a high economic power in a vertical partnership.

These regulations formed the basis of the proposed instruments of company-integrator election in the vertical partnership. As the main criterion of the election of the company-integrator it is proposed to use the degree of influence of the enterprise on the other participants. As far as vertical partnership is a consistent chain of interaction between enterprises, it represents process of dependences of each participant on previous elements for it (suppliers of raw materials, services and etc.) and on following elements (consumers of its products). Such situation leads to find the degree of influence of the enterprise on the partner based on the degree of partner dependence on the enterprise.

The degree of dependence as the main indicator of identification the integrator is a complex index, which is calculated by scoring its determinants by peer review. The main determinants of the degree of dependence on the previous element are the differentiation and volumes of raw materials purchased for the production of products; the availability of resources-substitutes; the costs of possible change of the supplier; the level of suppliers concentration; the value of orders for suppliers; quantity of other industries that require supplier products purchase cost in correlation with total costs; the impact of resource prices on the cost of the goods. The main determinants of degree of dependence on the following element is a concentration of buyers compared to the concentration of enterprises-competitors; the volume of purchases by buyers; customer costs on changing supplier; requirements to the level of standardization of products; buyer awareness; availability of goods – substitutes; correlation between the price and the total amount of purchases; expected benefits of the consumer.

Each determinant of degree of dependence both on the supplier and on the consumer is calculated on 6 – point scale (from 0 – no influence to 5 – very high). The general index of the degree of dependence of one company on another is calculated as the arithmetic mean of all its determinants. This degree of dependence completely determines the degree of influence of one enterprise on another. According to the results of analysis, the company that has the highest total point of degree of influence on participants of partnership is selected as company-integrator. If the total degree of influence of the individual enterprise is close to 100, it is characteristic for forming the system with a rigid vertical integration like corporation. If the figure is closer to 0, the relationships are competitive, which makes it impossible to establish a partnership, so the integration is difficult to implement.

Let's calculate the degree of dependence on the example of vertical partnership of enterprises of mining machinery, mining and related industries. It is a consistent channel of interaction between suppliers of raw materials, producers of components for the production of the equipment, producers of the equipment, producers of components and consumable tools for the functioning of the equipment at enterprises of mining industry. Each enterprise is either the previous or following element of the technological chain, in which involved companies from various industries. Data processing is carried out using SPSS software (see tab. 1).

Table 1

The degree of mutual influence of the partnership members

		The degree of influence of technological chain participants, points				
		Suppliers of raw materials	Producers of components for production the equipment	Producers of the equipment	Producers of components and consumables tool	Enterprises – consumers (mining industry)
Technological chain	Suppliers of raw materials	–	2,3	2,5	2,4	3,1
	Producers of components for production the equipment	2,7	–	3,5	–	–
	Producers of the equipment	3,5	3,8	–	4,1	2,6
	Producers of components and consumables tool	–	–	2,1	–	2,5
	Enterprises - consumers (mining industry)	2,1	–	2,4	4,6	–
	The total degree of influence of participants (points)	8,3	6,1	10,5	11,1	8,2
	Total normalized degree of influence of the participants (100 point scale)	18,77	13,8	23,75	25,11	18,55

The analysis has shown that the producers of components and consumable tools have the highest degree of influence in a vertical partnership of mining machinery. Therefore it should be offered as the company-integrator.

Producers of the mining equipment, mining companies, producers of components for production of the equipment and suppliers of raw materials, as a rule, are simultaneously participants of several channels. Therefore they can act in other partnership both as the company-integrator of partnership and as the partner without powers of the integrator. It generates lack of a tough linkage to this vertical partnership management coordination. However, the value and the degree of influence of the producers of consumable materials and components in the general chain of value creation of mining production tend to increase. For producers of mining equipment the service of mining enterprises by consumable materials and components isn't a core task. As a result, the degree of dependence on partners from serving companies that produce consumable tools and components is high. In order to ensure the guaranteed supply of products and coordination of production programs, the partners have to comply with their requirements. Therefore, forming the vertical partnership based on allocation of the serving company that produce consumable tools and components like the integrator is the most rational.

Conclusions and perspectives of further researches. Considerable opportunities of the effective using the potential of a machine-building complex of Ukraine are restrained by the lack of progressive models of interaction between enterprises, including supply of resources and sales of products according to individual needs of consumers.

The vertical partnership based on the model of Partner Relationship Management (PRM) is one of the most rational forms of interaction for the mining machinery in the current conditions of the domestic market.

Using PRM model for forming management tools requires taking into account industry-specific. Function of the systematic organization of relations in partnership "mining machinery – supply of materials, components, consumable materials, service – mining industry" it is reasonable to carry out on the base of the integrated technological chain with the coordination of activities by one of the participants.

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