

# ТЕОРІЯ І ПРАКТИКА ЕКОНОМІКИ ТА УПРАВЛІННЯ ПРОМИСЛОВИМИ ПІДПРИЄМСТВАМИ

## THEORY AND PRACTICAL ASPECTS OF ECONOMICS AND INDUSTRIAL ENTERPRISES MANAGEMENT

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### THE FORMATION OF A MARKETING INFORMATION SYSTEM ON THE INDUSTRIAL ENTERPRISE

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*Атюшкіна В.В. Формування системи маркетингової інформації на промисловому підприємстві.*

В статті запропоновано застосування модульного підходу до формування маркетингової інформаційної системи та її вбудовування до загальної інформаційної системи підприємства для ефективного використання інформації при прийнятті управлінських рішень щодо випуску товарів на промисловому підприємстві. Побудова інформаційної системи передбачає формування баз даних, які можна поділити на бази даних вхідної, внутрішньої та вихідної інформації. Модульний підхід використовує функціональний принцип накоплення інформації і дозволяє підвищити посадову та персональну відповідальність за якість, достовірність, доцільність та своєчасність наданої до відповідного модулю інформації. Іншим принципом формування модулів інформації є відповідність інформації структурі бізнес-процесу.

*Ключові слова:* маркетингова інформаційна система, модуль інформації, модель, підприємство, бізнес-процес

*Атюшкіна В.В. Формирование системы маркетинговой информации на промышленном предприятии.*

В статье предложено применение модульного подхода к формированию маркетинговой информационной системы и ее встраиванию в общую информационную систему предприятия для эффективного использования информации при принятии управленческих решений о выпуске товаров на промышленном предприятии. Построение информационной системы подразумевает формирование баз данных, которые можно разделить на базы данных входящей, внутренней и исходящей информации. Модульный подход использует функциональный принцип накопления информации и позволяет повысить должностную и персональную ответственность за качество, достоверность, целесообразность и своевременность предоставленной в соответствующий модуль информации. Другим принципом формирования модулей информации является соответствие информации структуре бизнес-процесса.

*Ключевые слова:* маркетинговая информационная система, модуль информации, модель, предприятие, бизнес-процесс

*Atiushkina V.V. The formation of a marketing information system on the industrial enterprise.*

The paper proposed an utilization of modular approach to the formation of a marketing information system and its integration into the General information system of the enterprise for efficient use of information when making management decisions about the release of goods in an industrial plant. Building an information system involves the formation of databases, which can be divided into a database of incoming, internal and outgoing information. The modular approach uses the functional principle of information accumulation and allows to improve official and personal responsibility for the quality, reliability, appropriateness and timeliness provided in the appropriate module information. Another principle of formation of information modules is the consistency of information to structure the business process.

*Keywords:* marketing information system, module of the information, model, enterprise, business process

In modern conditions of managing, the most important factors of successful activity of the enterprise includes information. It must be properly interpreted and used to achieve enterprise strategic goals. Specificity of an industrial enterprise marketing is that it needs to consider the needs of the industrial market directly and indirectly – consumer. Therefore, information support of marketing activity of an industrial enterprise is to lay the foundations of economic efficiency at all stages of creation, production and realization of goods subject to the requirements of industrial and consumer markets.

Information support of any activity must perform certain functions, among which are: the formation of databases of primary and secondary sources, organization of data Bank, organization of information saving way, determining and applying methods of search, transformation, and delivery to the user. The criteria for the effective execution of information system functions is the degree of utility obtained by the user information, the minimization of resource costs of obtaining and using information.

The leaderships having the necessary information, takes rational managerial decisions regarding the marketing activities of the enterprise and adaptation of its activities to the requirements of the external environment.

#### Analysis of recent researches and publications

Theoretical Information problems and information provision problems devoted a significant amount of works of foreign and domestic scientists and practitioners. Distinguished domestic and foreign scholars on issues of information provision of activity of the enterprise are A. Mishenin [1], O. Karmyn-

skyy [2], M. Yermoshenko [3, 4], M.S. Al-Audat [5], R. Bazzel, 1993, D. Cox, 1993, R. Brown, 1993 [6] and ect. They revealed the value of information in a market economy, its essence and quality characteristics, including how to minimize risk in the design and organization of marketing information solutions. Some of scholars proposed their own methods of structuring of a marketing information system (MIS) – model MIS F. Kotler [7], model of E. Duliniec, 1994, dynamics model MIC E. Li, 1995 [8], model of E. McCarthy, 1990 and B. Perreault, 1990 [9], model of Y. Talvinen, 1995 [10] by functional, subject, technological, subjective approaches.

### **Unsolved aspects of the problem**

Rationally and practically built marketing information system should help the industrial enterprise to structure the information from the external environment, to organize the internal information to optimize work with information requests from the marketing divisions of the company.

For industrial enterprises marketing information becomes the impetus to significant costs in time and money, given the generally long life cycle of goods, issued by the enterprise. As can be seen from the analysis of previous studies, structuring of MIS is possible to realize with different approaches. The choice will depend on the strategic goals of the enterprise and the needs of their information security, industry sector of the enterprise and market dynamics, the degree of enterprise diversification and differentiation of its products for the consumer. Marketing activity is one of activities of an industrial enterprise along with industrial, financial, innovative, investment and other species. Therefore, in our opinion, based on the model of structuring of information developed by foreign scientists, and experience in the analysis of qualitative characteristics of information, further development takes questions from the incorporation MIS into the general information system of the enterprise with an integrated structure of certain modules of information.

*The aim of the article is* the use of modular approach to the formation of a marketing information system and its implementation to a common information system for efficient use of information when making management decisions about the release of goods in an industrial plant.

### **The main part**

The main task in the field of information support of marketing activity of the company is to build a system of information delivery to managers in accordance with their level of competence and responsibility. Thus, the information should be responsible for the scope, quality and timeliness of the tasks that are solved in defined parts of the enterprise.

Usually marketing information system is defined as a set of measures, designed for collection, processing, analysis, evaluation and dissemination of relevant and reliable data for the purpose of information support of marketing decisions, as well as

providing the necessary process of human and material resources [1]. Foreign scientists developed a number of approaches to formation of structure of MIS, among which the most used is the functional approach to the creation of an information system depending on the fulfillment of certain functions.

Classic marketing theory and innovations F. Kotler in the work [7] notes, that to MIS the enterprise structure includes such components as the internal reporting system, marketing research system, the system analysis of marketing information, the current system of collecting external marketing information.

According to dynamics model MIS E. Li [8], it has two main subsystems, input and output, with two data banks that interact with each other. In model E. McCarthy and B. Perreault MIS defined as a mechanism for continuous collection and analysis of data to ensure their company's marketing department. This model, unlike other proposed, provides for the establishment of an integrated closed system, a central component of which is the integrated database [9].

Model of Y. Talvinen has aims to create such a MIS, which could operate with systems that already exist in the firm, at the same time subordinating all the activities of the effectiveness of the process of marketing management. The researcher stresses that the information provider for marketing departments is not only MIS, but also other information systems. He highlights systems that help improve and analyze marketing information: Transaction Processing System, TPS, Management Information System, MIS, Decision Support System, DSS, Executive Information System/Executive support system, EIS/ESS [10].

In terms of sources of information in the information system of industrial enterprise it is possible to allocate subsystem data used in various types and at different stages of activities. Among these subsystems stand out:

- subsystem of scientific and technical information, providing researchers and practitioners with methodology and technique of scientific analysis of the status and trends of the industry;
- subsystem reference information used for operational support of specialists needed in the job data, optimizing the scientific, educational and production activities;
- subsystem of legal information necessary to provide information of a normative character, which ensure the reliability and stability of the enterprise, its operation, subject to the requirements of state and local laws. The subsystem consists of legal documents of state and local significance, professional organizations, unions, associations, businesses, charters, patents, explanations and comments;
- subsystem general economic information about the state of national and world economy, the situation in individual industries, economic trends, the influence of the state on the relevant industries. Subsystem comprise analytical reviews

- of development the domestic and foreign economy, the industries characteristics, enterprises, economic and social forecasts, state and local programs, the predictions of sociologists, economists, political analysts, political figures on the economic situation;
- subsystem financial information provides information about state finance of the foreign exchange market, banks, securities markets;
- subsystem price information that provides data about the dynamics of prices for goods and services;
- subsystem statistical information, which provides experts needed in the operation of the digital data on the development of modern economy, the state of her industries, the welfare of the population, demographic data, etc. The system is based on the data of the State statistics service of Ukraine, and similar foreign organizations, sociological and demographic studies research institutes, enterprises;
- subsystem commercial information, is a complex of information used in practical marketing

- activities – data on producers and the supply of goods and services, results of sociological and marketing research, advertising, media reports, information on competing organizations, etc.;
- subsystem internal information, which includes a range of information resources reflecting the situation within the enterprise: accounting documents, plans and reports, internal documents, the data on the availability of goods in the warehouse, the information about the product, etc.;
- subsystem service information includes relevant factual and background data for various areas of service and support marketing activities [2].

In our view, the information system of marketing activity of industrial enterprise is directly connected with the structure and components of its internal business process which is the main activity of the enterprise. In Fig. 1 a schematic diagram of the formation of the information system by stages of the business process industrial company to develop and implement product.

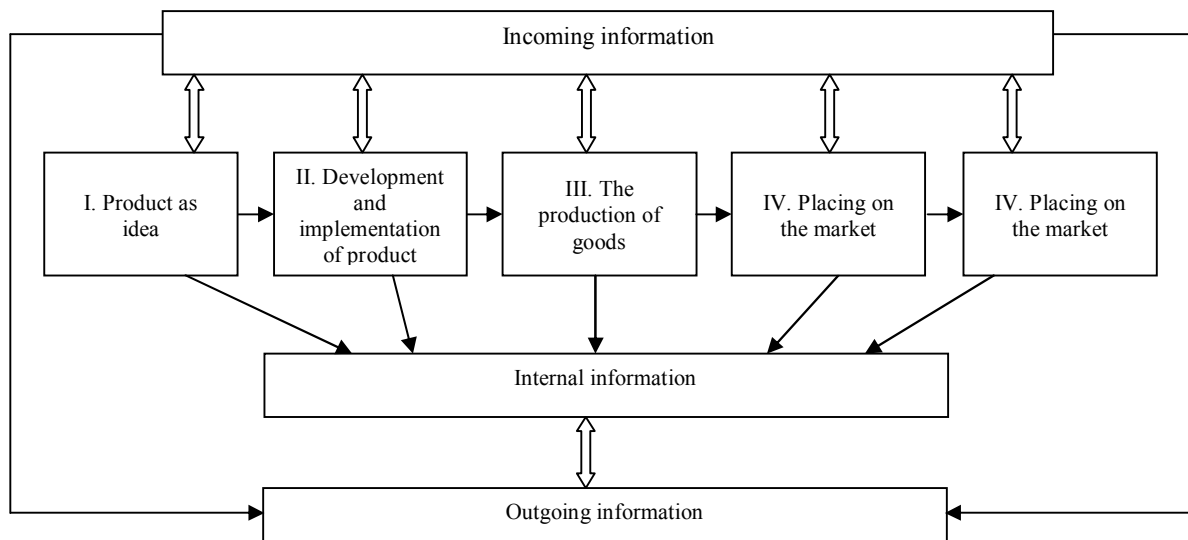


Fig. 1. The stages of the business process of industrial companies to manufacture goods  
Source: Own elaboration

Building an information system involves the formation of databases, which can be divided into a database of incoming, internal and outgoing information. In our opinion, is expedient modular approach to the systematization of information that relating to all business processes and activities, including marketing. Under these conditions, each of the databases should consist of specific modules of information (MI), which is installed separately and can be changed if necessary. The modular approach uses, on the one hand, the functional principle of information accumulation and to improve job and personal responsibility for the quality, reliability, appropriateness and timeliness provided by the corresponding module information. Another principle of formation information modules is the consistency of information to the structure of the business process.

The information in the corresponding set MI is formalized in a convenient way and verificatisi to further the effective use of a single center of information support [11].

Each of the levels of enterprise management for planning its activities require varying marketing information, depending on the goals and objectives that are put forward strategic, operational management, for the solution of tactical tasks. It should be noted that for large enterprises, many of which are industrial enterprises, the allocation of the operational and strategic levels MIS gives you the opportunity to increase the efficiency of management, including marketing activity of the enterprise. And with that there is a definite hierarchy, additional complexity in access to information in the enterprise.

To ensure the effectiveness of information system should run certain principles of its construction, namely:

- the interdependence of the sources of information that ensures the integrity of the information array used in the business process of the enterprise;
- balance of external and internal sources of information that will contribute to the completeness and consistency of information support of activity of the enterprise;
- eligibility information, which affects its accuracy;
- openness of the internal information of the enterprise, which increases transparency and the quality of the information environment of industrial enterprises;

— consistency of information sources, which affects a purposeful, orderly and conscious work with information, and ensure its relevance in the context of the preparation and implementation of marketing solutions [4].

The matrix modules of information may have the following form (table 1).

The use of all modules of the information contained in the matrix, or some of them will depend on the circumstances of the entity, its organizational structure and capacity to collect and process information. The modular structure of the information it organizes the flow of information between the different structural divisions of the enterprise vertically and horizontally, creating a system of transparency and free access to necessary information.

Table 1. The matrix modules of information for the formation of the marketing information system of the enterprise

Business process stages of industrial enterprise (Ei)	Information type	Functional activities of the enterprise				
		marketing (M)	production (P)	research and development (RandD)	financial (F)	investment (I)
I-V	Incoming	MI (Ei M)	MI (Ei P)	MI (Ei RandD)	MI (Ei F)	MI (Ei I)
	Internal	MI (Ei M)	MI (Ei P)	MI (Ei RandD)	MI (Ei F)	MI (Ei I)
	Outgoing	MI (Ei M)	MI (Ei P)	MI (Ei RandD)	MI (Ei F)	MI (Ei I)

Source: Own elaboration

Given the matrix represents one of the variants of the structure the enterprise information system with the ordering information on the stages of the business process of the company with respect to information of incoming, internal, or source and functional activities of the enterprise.

Marketing activity is just one of the activities of any industrial enterprise in conditions of market economy, but marketing information need of all types of activities, levels of planning (strategic, operational, tactical) of the enterprise and all stages of the process creation and implementation of product.

At the stage of formation the ideas of a product must be created information modules:

- Input – MI search events (characteristics of product, technology, resource, organizational, marketing and infrastructure innovation, the value of patents, know-how, scientific-methodological developments in the field of marketing, etc.), MI buyers, customers and competitors (the formation of the portfolio of pending orders, qualitative and quantitative characteristics of the products-analogues);
- internal – MI R & D (engineering research and development, marketing research).

During the implementation phase of the product used database:

- incoming information – MI resource requirements (means of production, objects of production workers (qualifications, experience, level of remuneration), MI financial security (the conditions for granting and repayment of the loan,

inflation, interest rates on deposits, intentions with respect to investments by investors according to the method of capital participation and acquisition of securities);

- internal information – MI development works (parameters of technical specifications, technical proposals, conceptual design, technical design), MI technical and economic indicators (production capacity, composition and qualification level of employees, the composition and accuracy class of technological equipment, etc).

At the stage of production of the goods used as input the same MI, and for stage II, and the internal information is displayed in MI technical and economic indicators, MI financial and economic indicators (data of production volume, costs, prices, availability of own funds), MI management indicators (time of product release, delivery, deviation from the planned indicators, information on the stages of the innovation life cycle, the indicators of the operating activities of the enterprise, etc.).

In the fourth stage – implementation of the market – is used as input in the form of MI buyers, customers and competitors (the calculation of indicators of MI takes into account the deviation from the corresponding primary information I stage); a database of internal information include the MI financial and economic indicators, the MI management indicators.

MI stages of service and maintenance of the goods requires the accumulation of the input as with the previous stage (with feedback) and external market



information (perception by consumers, consumer requirements, the possibility of changing the characteristics of the goods, the number of failures and marriage and etc.). The inputs in turn or at the same time is input for the next stages of the process development of the product, or generated in accordance with user needs.

### Conclusions

The feasibility of the modular approach to the formation of a marketing information system in the information system of the company is justified in a number of scientific works of domestic and foreign scientists. In results of the study of this question in relation to activities of industrial enterprises, proposed a modular approach to the formation of the MIS as

part of the overall information system of an industrial enterprise. The structure of the enterprise information system can be formed, on the one hand, by combining modules of input, internal and output base and, on the other hand, involves the segmentation of information modules by phases in the business process of the enterprise – the creation and implementation of product. The third source of information modules perform functional activities of an enterprise.

Given the above, a promising direction for further development of this issue may be deepening detail of the structure of modules of information, and consideration of the influence of some factors on the information system, especially the risk factor of inaccurate information.

### Abstract

**Purpose:** The information support of marketing activity of industrial enterprise is expected to lay the foundations of economic efficiency at all stages of creation, production and realization of goods subject to the requirements of industrial and consumer markets.

The aim of the article is the use of modular approach to the formation of a marketing information system and its implementation to a common information system for efficient use of information when making management decisions about the release of goods in an industrial plant.

**Methods:** The author emphasizes that the information system of marketing activity of industrial enterprise is directly connected with the structure and components of its internal business process which is the main activity of the enterprise. The paper presents the concept of formation of information system by stages of the business process of an industrial enterprise for the creation and implementation of the product.

A modular approach to the development of the information system uses, on the one hand, the functional principle of accumulation of information. Another principle of formation of information modules is the compliance of information of the structure of the business process. Information together with relevant modules of the information is formalized in a convenient way and is verified to further the effective use by the single center of information support.

**Results:** The paper proposed a modular approach to the formation of a marketing information system as part of the overall information system of an industrial enterprise. The structure of the enterprise information system can be formed, on the one hand, by combining modules of input, internal and output base and, on the other hand, involves the segmentation of information modules by phases in the business process of the enterprise – the creation and implementation of the product.

*JEL Classification: M31.*

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