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ЧИННИКИ, ЩО ВИЗНАЧАЮТЬ ІНФОРМАЦІЙНЕ ЗАБЕЗПЕЧЕННЯ ВЗАЄМОВІДНОСИН З КЛІЄНТАМИ МАШИНОБУДІВНИХ ПІДПРИЄМСТВ

Анотація. *Впровадження CRM-технологій дозволяє систематизувати великі обсяги даних сучасних підприємств, які розміщені та зберігаються на різноманітних носіях. Належна інтерпретація цих даних сприятиме покращенню товарів і послуг, внутрішніх бізнес-процесів і навіть вдосконаленню ділової стратегії. Пропозиції CRM-продуктів відрізняються за функціоналом, рівнем інтегрованості, вартістю тощо. Перед компаніями, які обирають CRM-системи та формують структуру інформаційного забезпечення у сфері управління взаємовідносинами з клієнтами постає ряд запитань щодо відповідності принципам оптимальності, функціональності, надійності, безпеки, ергономічності та ін.*

Метою статті є теоретичне обґрунтування передумов формування інформаційного забезпечення взаємовідносин з клієнтами машинобудівних підприємств. Відповідно завдання статті визначені як формулювання ключових чинників, які визначають інформаційне забезпечення взаємовідносин з клієнтами машинобудівних підприємств.

Аналіз літературних джерел, результатів дослідження стану інформаційного забезпечення взаємовідносин з клієнтами вітчизняних машинобудівних підприємств і врахування передового досвіду зарубіжних компаній у сфері клієнтоорієнтованості дозволив виділити дві групи таких чинників: зовнішні та внутрішні. Обидві групи чинників можуть мати як стимулюючий, так і стримуючий вплив на формування інформаційного забезпечення взаємовідносин з клієнтами.

Перспективи дослідження тематики інформаційного забезпечення у сфері CRM на вітчизняних машинобудівних підприємствах у значній мірі залежить від усвідомлення керівниками необхідності переорієнтації роботи на клієнта та рівня розвитку інформаційно-комунікаційної інфраструктури. У свою чергу передумовами формування та розвитку такої інфраструктури є державна підтримка й активізація підприємницького сектору у сфері інформатизації.

Ключові слова: *управління взаємовідносинами з клієнтами, орієнтація на клієнта, інформаційна система.*

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FACTORS DETERMINING THE MACHINE BUILDING COMPANY CUSTOMER RELATIONSHIP SUPPORT INFORMATION

Abstract. *Introduction of CRM-technologies allows for systemizing a large amount of modern enterprise data stored on various media. A proper interpretation of such data will make it possible to improve goods and services, inner business-projects and business strategy improvement. CRM-products differ in their functions, level of integration, price etc. When choosing CRM-systems and shaping the structure of customer relationship management, companies face a range of questions regarding the conformity with optimality, performance, reliability, safety, usability etc.*

The purpose of this article is to provide a theoretical reasoning of the preconditions for shaping customer relationship management at machine-building enterprises. The task of the article is as follows: forming key factors determining the customer relationship management at machine-building enterprises.

The analysis of literature, study of customer relationship management results at machine-building enterprises and consideration of experience of customer-oriented approach demonstrated by leading foreign companies enabled us to single out two groups of factors: external and internal. Either one can affect the process of shaping customer relationship management by bolstering it or slowing it down.

Further research related to CRM information support at domestic machine-building enterprises relies heavily on the fact whether the managers realize the necessity to implement a customer-oriented approach and whether the information and communication infrastructure develops fast enough. In turn, such an infrastructure cannot be formed and developed with no state support and activation of entrepreneurship sector in IT sector.

Keywords: *customer relationship management, customer orientation, information system.*

Problem statement. The information system of modern organization can embrace a wide range of various data (i.e. technical-, market-, personnel- and financial-related ones) that are stored on different media (paper, electronic and digital ones, etc.). However, most of the strategically significant customer-related information of many domestic companies is only stored in some employee's memory. The CRM-technology introduction allows for systematization of a large scope of data that, if properly analyzed and interpreted, may become valuable in terms of improving goods and services, internal business processes and even the business strategy.

Latest research and publication analysis. The difficulty of the issue of customer relationship information support is caused by its interdisciplinary nature, as this issue deals with management, marketing and information technologies. The issue of information technology application in a range of modern company activity was studied by the following scholars: B. Breen, T, Gilbert, I. Hordiienko, N. Yermoshkin, Yu. Kolosov, Ph. Kotler, J. Manyika, O. Matov, O. Okhoba, O. Potai, M. Romanchukevych, R. Roberts, A. Tarasov, K. Sprague etc. Some theoretical principles as well as applications of the company information system functioning and formation were studied in the papers by A. Ashuiev, A. Bereza, A. Hladii, L. Yezhova, A. Yermoshenko, N. Yeriomina, O. Kraieva, K. Meleshko, T. Moiseienko, M. Nersesian, T. Pysarevska, V. Porokhnia, V. Sytnyk, A. Tarasov, J. Timmons, S. Yakovenko etc.

Task setting. CRM-products are different in terms of functions, integrity level and price, etc. When choosing a CRM-system and forming the customer relationship information support,

companies face a range of issues regarding the compliance with optimality, performance, reliability, safety and usability principles. From the methodological point of view, this problem settlement demands a formulation of the key factors that determine the machine building company customer relationship information support.

Main body. The analysis of literary sources [1, 2], the research results of customer relationship information support at domestic machine building companies and regard of the foremost customer-oriented experience of foreign companies enables us to distinguish between two groups of important factors: those caused by the environment influence and those caused by the company's internal features and peculiarities.

Thus, the external factors determining the customer relationship information support include the following ones:

- the level of the country's information and communication infrastructure development;
- the state support of computerization system innovative projects;
- the development level of the market where the company functions;
- the business competition;
- the number of market sectors as well as their type and geography;
- the complexity, uncertainty level and environment change rate;
- the level of the consumer's purchasing process involvement.

Since CRM-implementation is based on computer technology usage, the level of information and communication infrastructure in the country is one of determining factors in formation of customer relationship information support. The studies testify to the fact that the access to Information technologies is the key factor of entrepreneurial activity. The comparison of certain indicators of Legatum Prosperity Index project (index of country prosperity) and number of protected Internet-servers per 1 mln. people enable us to assess that a higher Internet access level means a higher entrepreneurship capacity of the country [3].

Speaking about the level of information and communication infrastructure, Ukraine is lingering behind the world average integrity level into the global web-space [4]. Meanwhile, the international companies of information technology industry are getting closer to the marginal growth indicators within developed countries, thus their field of interests will be constantly moving towards bigger markets of developing countries. That is why we can hope for a more active IT usage in various spheres of the Ukrainian economics.

An important role in information system formation is played by the state support of computerization-related innovative projects. Unfortunately, it is nowadays limited to reporting the necessity of improving the information and communication technology implementation to introduce Ukraine into the global media scene and enhance the legal basis as well as develop programs and ideas.

On the legislative level, the activity in computerization is controlled by the following statutory acts: the Law of Ukraine *On Information*, the Law of Ukraine *On the Basic Principles for the Development of Information-Oriented Society in Ukraine for 2007-2015*, the Law of Ukraine *On the National Program of Informatization*, the Law of Ukraine *On Protection of Personal Data*, the Law of Ukraine *On Telecommunications*, the Law of Ukraine *On Electronic Documents and Electronic Document Turnover*, the Law of Ukraine *On Electronic Digital Signature*, the Law of Ukraine *On Information Protection in Automated Systems*.

The national informatization program determines the strategy of the problem settlement to solve the information problems and information support of social and economic, ecological, scientific and technological, security, national and cultural as well as other important fields [5]. Some technical specifications, electronic digital signature, electronic document turnover draft the Law of Ukraine *On Electronic Commercial Activity* and Information Code of Ukraine are on the development stage.

The level of market development is also a significant factor defining the customer relationship information support at domestic machine building companies. Despite the relevance of

information system and computerization development issues, the CRM-systems being introduced at companies differ considerably in terms of their implementation conditions. Most projects are being introduced in service and trade branches. According to the analysis demonstrated, the percentage of machine building company projects is not over 1 %. It may be explained by a lower competitiveness level in machine building industry than in service and trade field, a longer payback period of these investment projects as well as industry peculiarities of customer relationship in major sectors.

Thus, industries with less investments, higher income and money turnover see a faster development and implementation of innovations. The same can be said about the machine building industry where separate sectors and segments develop unequally. The most advanced sector is the motor industry, while other sectors like machine and equipment manufacture, electric and optical devices production are developing far slower.

One of the most distinguishing information system factors is the market competition level. The bigger is the customer's influence on the market (market of pure competition), the more inventive manufacturers must be when it comes to customer relationship formation and the higher demands must be set to such customer relationship information support. The competitiveness level on the domestic machine building market is insignificant, as most machine building companies are very specialized. At the same time, foreign companies, especially household appliances and motor vehicles, are much more dangerous for domestic companies in terms of competitiveness. The government occasionally resorts to protection measures which do not really affect the competitiveness of domestic companies, though. Neither do they induce the development of customer relationship control systems.

The information support is also dependent on the factors like the number of market sectors, their types and geographic location. Every company has its own needs in information and other input parameters related to the company activity, its complexity and scope. Most companies of the developing countries work for either local or regional markets (they can also act as mediators or processing companies on the global market). Thus, their information systems efficiency is most of the times attained due to a better usage of basic business communication. The firms dealing with cross-border ties (import, export companies and tourism) are in urgent need of receiving and distributing business information via Internet.

The next important factor to be considered when developing an information system is the level of environment uncertainty. Herein, the following principle works out: the more complex and changeable the company activity environment – the higher the demands to the systems itself as well as to its information support. For instance, when the uncertainty level is rather high, it is of utmost importance for the information support to be flexible enough. It is also important to have a possibility of quick feedback and good connection between the information and functional subsystems. In this way, the information and its analysis of one subsystem are faster reflected in the other one.

One of the factors determining the customer relationship system as well as this system information support structure and content is the type of the customer's behavior and the level of the customer's involvement into the purchasing processes, i.e. the more difficult it is to make a decision of purchasing, the bigger number of participants is required and the more cautious the client is.

The customer's behavior types depend on their involvement and difference in the same products made by different manufacturers. The customer high involvement is typical in cases when the product is expensive, its purchase means some risk, the product is bought quite rarely and the product is a means of self-actualization. The more technically and technologically demanding the product is, the more probable is the difference between the same products of various manufacturers; hence – the more complicated the customer's behavior is going to be.

Most machine building goods fall into the category of technically demanding products characterized by a long service life and requiring additional services (installation, maintenance, special training, warranty and post-warranty services).

The interaction with company customers interested in the industrial market is even more complex, as very often equipment manufacturers cooperate with their clients in the process of projecting and technical preparation of the manufacture to take their customers' needs into account.

These external factors determining the customer relationship information support are formed directly in the business environment and may hardly be controlled by the company itself.

The internal factors listed below also have a considerable impact on the information system development:

- the company strategy;
- the company customer-oriented policy;
- the company business processes;
- the organizational factors (the company size, structure and life cycle stage);
- the structure if the business portfolio;
- the personnel qualification;
- the company hardware, software and engineering support;
- the company financial capabilities;
- the tasks faced by the CRM-systems.

One of the information system distinguishing factors is the competitive strategy type, as it determines the company behavior and guidelines on the market, the nature of customer relationship and, as a result, the information support of the customer relationship control system.

Since they provide an effective cooperation with market mediators, the information systems are rather important for the firms striving to survive on the market and have a long-term success to serve customer markets. The growth-oriented firms strive to expand the market. A high level of company integration into marketing systems demands perfection of the customer relationship information support, owing to increase and complexity of information, reduction of information basis gaps as well as enhance of external communication impact. The perfection process is usually accompanied by the transition from a paper information system to an IT system used for PC-based processing of information, from face-to-face to telephone contacts and IT application involving mobile phones, emails and Internet.

The structure and content of the customer relationship information support is rather dependent on the company client-orientation policy, the latter being determined by the type of competitive strategy. According to M. Porter, there are two essentially different competitive strategy types: cost leadership and differentiation. As a rule, the cost leadership type companies have restrained opportunities of personified customer relationship, consideration of their needs in the process of manufacture, financing of processes of information system development and support. However, the necessity to arrange CRM-system at these companies may be explained by the opportunities and extra benefits it brings. The companies pursuing the cost leadership strategy should work on synchronizing the customer's demand with their manufacturer's capacities, optimizing and enhancing the key business processes to reduce the prime cost of items, striking a balance between the interest of the firm and the customer's desire to spare some money, while forming the information system. The differentiation strategy means the information system application to analyze and systematize the customer-related data, detect and consider the needs of various market segments and introduce new product types. This strategy grants for the company a broader base to finance CRM-systems. It sets higher requirements when it comes to information content, organization and analytical capabilities, though.

One of the options of the client-oriented policy is the implementation of a system enabling the client to get some information on their order status at any time. Due to this online system, customers have a constant access to the relevant and objective information on the terms of their order processing (for industrial market) that, when combined with a high servicing level and clear promise fulfillment, creates a favourable environment to establish a positive customer relationship experience.

Certain customer-oriented motor vehicle manufacturers introduce innovative services to provide a high level of customer service. For example, as of August, 2000 the European owners of *Mercedes* and *Maybach* have been using the services of *Telediagnosis* and *Mercedes-Benz Info-service.* The services may be used by the customers who have their motor vehicles equipped with a television transmitter. In case of failure, the system makes use of GPS (Global Positioning System) to offer a special support service according to location and brings the car diagnosis onto display. A driver can contact the service center expert by pressing a special button. Over the last few years we have been experiencing a constant growth of the performance quality and range of services offered by the Customer Service Centre [6, P. 32].

One of the defining factors impacting the customer relationship information support development is the company's nature and business project features. The process approach in management allowed for different service types to be subdivided into separate processes that, in turn, led to appearance of new notions like *outsourcing* and *offshoring*. Outsourcing (the usage of the external source or resource) is the transfer of some business projects or functions from one company to the other one specializing in a particular field. Offshoring (to periphery) is similar to outsourcing being related to the territory outside the country. It is the tendency established in some developed countries, primarily the USA. Later on the companies resorted to IT-service offshoring possibilities as well as offshoring of other IT-related services bringing them to other (developing) countries that could offer a cheap workforce and additional human resources.

The global outsourcing market was assessed to be worth about $ 800 bln back in 2012. 88 % belonged to the domestic one (within the country) and the rest belonged to the foreign one (offshore). Two thirds of the global outsourcing market services are the information technology and computer technology industry: programming, system integration, IT-consulting, software design and servicing [7, P. 49].

The customer relationship information support is to a great extent controlled by the organizational factors characterizing the company size, structure and life cycle stage. The bigger the company is and the longer it has been operating on the market, the harder it is to introduce crucial changes into the customer relationship system and information support. On the contrary, the young companies have a bigger potential to be rebuilt on all the levels, i.e. organizational, functional and informational.

Speaking about the control structure, the functional-hierarchical control structure has been long considered as classic and fulfilled the task of controlling big enterprises including the machine building ones. However, the development of the information society and competitiveness have led to more companies starting to use the process structure enabling some changes related to a better flexibility, controllability and efficiency of internal processes.

The life cycle stage is an organizational factor making its own alterations in CRM-system construction. Every company stage has its own targets and strategy. Thus, the information system is to provide the immediate problem solution and effective customer relationship development in compliance with the company strategy.

The information system is to a great extent determined by the business portfolio structure. It can be characterized by two features: the number of business types and the nature of their ties. The companies that have a large number of business units (business entities), are rather sustainable and have weak ties, use the CRM-system structure enabling every entity to independently control its databases. Some diversified companies of this type use a complex information system on the corporative level. These systems allow for uniting the data bases of separate entities to be used by the managers when analyzing the business portfolio and developing strategic goals. The diversified companies having a few business types with tight connections in their business portfolio make use of complex functional subsystems appropriate for every business type. However, the CRM-system is integrated in terms of information support.

In the knowledge-driven economy era, the human resources are the element of utmost importance as well as the company's biggest capital characterized by a certain education level, experience, skills, motivation and initiative etc. thus, the personnel qualification is one of the most

significant factors forming the customer relationship information support. Here, the qualification means not only computer and software technical skills. It also involves having a wider range of competences in the customer relationship service, i.e. being able to realize the importance of every customer and from every entity that interact or can interact with either real or potential customers, having communication skills and motivation to achieve the customer loyalty. It is also important to spot the employees with considerable knowledge and encourage them to develop and implement CRM-systems.

IT experts are primarily responsible for modern ICT implementation. Despite a considerable demand of such specialists on the domestic market, *The Ukrainian Hi-Tech Initiative* reports three fourths of leading Ukrainian outsourcing companies to be working in the shady sector and providing services for foreign companies [7]. Thus, one of the state information policy priorities is to prevent the drain of qualified IT-specialists to other countries or shade sector of the national economy.

The customer relationship information support level is also influenced by the hardware and software support of the company as well as its computer technology current condition. Medium and large machine building companies operating abroad typically use the newest software offered by Enterprise Resource Planning, Materials Requirements Processing allowing for control and coordination of supply chains crucial for the smaller companies. The CRM-system development and improvement is considerably affected by the development of modern technologies offering wireless devices, video communication means, cryptotechnology etc.

Xerox company is one of the leading ones when it comes to new information technology implementation. The latest copy machines have an RIC system (remote interactive communications) keeping track of microcircuits and using artificial intelligence to predict possible failure time. The RIC system contacts the company entities automatically and sends its own prognosis while the computer makes analysis and plans the service workers visit to check the device even before its failure occurs. This system introduction means a high service level for the customer and a constant information collection opportunity for the company [8, P. 155].

An important place in information system development is occupied by the company's financial status. According to the survey conducted by *Gartner* analytical company, a medium-size businesses (to be competitive) are to plan their CRM-decision and maintenance expenses of approximately $ 3.9 – 5.4 thousand per one customer / three years. It will make the company competitive. Given the domestic machine building companies, not each company can finance such expenses. However, it should be mentioned that a considerable part of the expenses is spend on the project implementation and integration during the first two years, while the further system maintenance costs are much lower.

Important factors affecting the customer relationship information support are the tasks to be set by software, according to the company needs. The machine building company managers set the following CRM-system tasks:

- to create a unified source of information on current and potential clients;
- to store the customer relationship history;
- to make the control and report function automatic;
- to help organize the personnel work hours;
- to create a base of standard problem solution;
- to create a document library;
- to form a unified product catalogue;
- to optimize the process of drawing agreements.

An effective information system is to provide the task fulfilment and include some additional options as well as enhance the existing functions. In this case the system implementation costs may be justified.

The internal elements determining the customer relationship information support are dependent on the very company and may be even altered while implementing the system.

The general overview of both external and internal factors determining the customer relationship information support can be found in Figure 1.

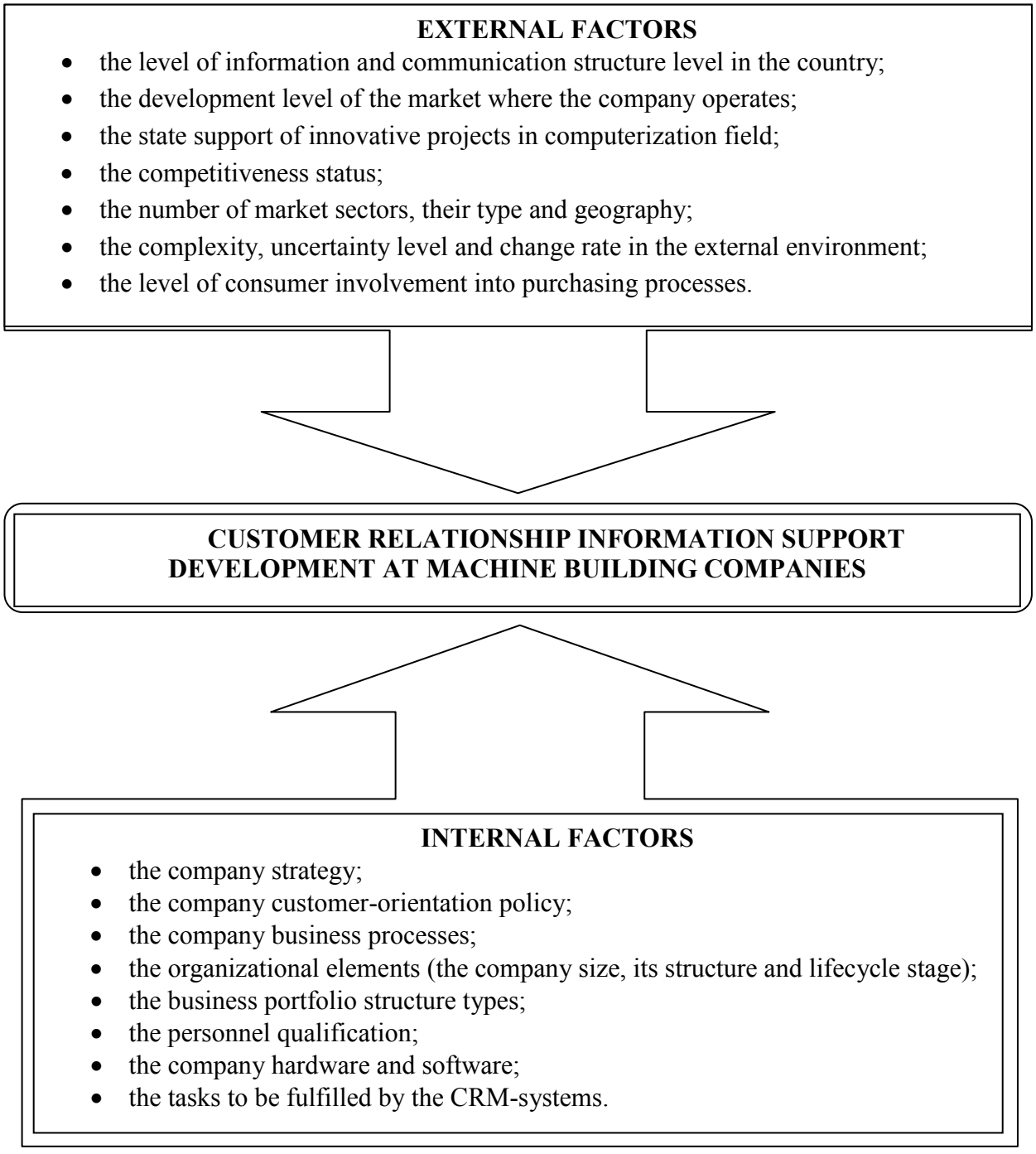

Fig. 1. The internal and external factors determining the customer relationship information support

The above-mentioned and described factors can be either favourable or unfavourable in terms of customer relationship information support development.

However, while analyzing the machine building company activity, some problems were found out that hinder the implementation of innovative customer relationship control ideas and development of proper information support. We have grouped them in three categories: the cost problems, the knowledge problems and other problems.

The machine building company managers mentioned the following problems to be among the cost problems:

- the lack of assets to finance such innovations;
- the complexity of money attraction from external sources;
- a rather high cost of such projects for the domestic machine building companies and a long-term pay-back period;
- a high price of external specialists work (the implementators);
- a high price and time-duration of own specialist training.

The managers speak about the following knowledge problem factors slowing the process:

- the lack of qualified personnel of the company;
- the resistance against changes;
- the absence of information on the very idea, technology and software to implement it;
- the complex process of searching partners for cooperation and implementation of the customer relationship information support projects.

The other problems slowing the customer relationship support development at the machine building companies comprise a bad experience of previous innovations, the uncertainty of the market demand and unstability, a weak information and communication infrastructure development in the region.

Conclusions. The analysis of the existing status of the machine building company customer relationship information support enabled us to make the following conclusions: this development is affected by both external and internal factors. However, the introduction of the modern customer relationship information support methods based on usage of large information scope and special information system development are to a great extent dependent on the managers' understanding of their company goal change to being customer-oriented; the development level of the information and communication infrastructure is also of great impact here. The state support and entrepreneurial sector activation in computerization are important preconditions of such infrastructure development as well.

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