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Automating the relationships between printing companies and their stakeholders

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The dynamic development of the printed goods market requires ensuring manageability and flexibility of printing business. Nowadays any printing company needs to meet stakeholders' requirements. Moreover, it should constantly monitor, analyze and assess their satisfaction. But monitoring and analysis without a quick and proper response to stakeholders' actions do not always bring the required results. Evaluating the competitiveness of a printing company can help it to keep up with the competition. The integration of a decision support system into the automated system of a printing company will allow it to make informed decisions. Maintaining the customer-oriented nature of a printing company requires the usage of modern technologies and the leading place among these technologies belongs to CRM systems. Automated systems based on CRM technologies are present in the market of printing services, but none of them makes it possible to improve the efficiency of the relationship between a printing company and its stakeholders. Therefore, the development of the system that would meet all the requirements of a printing company and support the effective decision-making process is quite relevant.

Keywords: *printing company, CRM systems, decision support systems for printing companies.*

Автоматизація побудови відносин видавничо-поліграфічних підприємств із стейкхолдерами

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У сучасних умовах однією з ключових проблем економічного розвитку стає забезпечення конкурентоспроможності продукції, зокрема поліграфічної. Динамічний розвиток ринку поліграфічних товарів вимагає забезпечення керованості й гнучкості бізнесу. Для того, щоб витримати конкуренцію, видавничо-поліграфічне підприємство має, насамперед, задовольнити усі вимоги не тільки замовника, але й усіх стейкхолдерів. Оцінка задоволеності замовників та стейкхолдерів продукцією, послугами та замовленнями потребує постійного моніторингу, аналізу та контролю з боку видавничо-поліграфічного підприємства. Моніторинг та аналіз без правильної відповіді на дії стейкхолдерів не принесе потрібних результатів. Впровадження систем підтримки прийняття рішень в систему видавничо-поліграфічного підприємства надає конкурентні переваги підприємству.

Витримати конкуренцію, видавничо-поліграфічному підприємству дозволить задоволення усіх вимог стейкхолдерів. Оцінка задоволеності стейкхолдерів потребує постійного моніторингу, аналізу та контролю з боку видавничо-поліграфічного підприємства. Моніторинг та аналіз без правильної відповіді на дії стейкхолдерів не принесе потрібних результатів. Розрахунок конкурентоспроможності видавничо-поліграфічного підприємства дозволить підтримувати конкурентні переваги підприємству. Впровадження системи підтримки прийняття рішень в автоматизовану систему видавничо-поліграфічного підприємства дозволить приймати підприємству обґрунтовані рішення.

Клієнтоорієнтованість видавничо-поліграфічного підприємства потребує використання сучасних технологій. Ведуче місце серед цих технологій займають CRM-системи. Автоматизовані системи засновані на CRM-технологіях мають місце на ринку поліграфічних послуг, але жодна з них не надає можливість для удосконалення ефективності взаємовідносин видавничо-поліграфічного підприємства з стейкхолдерами. Тож розробка такої системи, яка б відповідала усім вимогам видавничо-поліграфічного підприємства та давала можливість ефективно приймати рішення є доволі актуальною

Ключові слова: *видавничо-поліграфічне підприємство, CRM-систем, системи підтримки прийняття рішень видавничо-поліграфічних підприємств.*

Автоматизация построения отношений издательско-полиграфических предприятий со стейкхолдерами

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Выдержать конкуренцию, издательско-полиграфическому предприятию позволит удовлетворить все требования стейкхолдеров. Оценка удовлетворенности стейкхолдеров нуждается в постоянном мониторинге, анализе и контроле со стороны издательско-полиграфического предприятия. Мониторинг и анализ без правильного ответа на действия стейкхолдеров не принесет необходимых результатов. Расчет конкурентоспособности издательско-полиграфического предприятия позволит поддерживать конкурентноспособные достоинства предприятия. Внедрение системы поддержки принятия решений в автоматизированную систему издательско-полиграфического предприятия позволит принимать обоснованные решения. Клиентоориентированность издательско-полиграфического предприятия требует использования современных технологий. Ведущее место посреди этих технологий занимают CRM-системы. Автоматизированные системы, основанные на CRM-технологиях, имеют место на рынке полиграфических услуг, но ни одна из них не дает возможность усовершенствовать эффективность взаимоотношений издательско-полиграфического предприятия со стейкхолдерами. Поэтому разработка такой системы, которая бы отвечала всем требованиям издательско-полиграфического предприятия и давала возможность эффективно принимать решения достаточно актуальна

Ключевые слова: *издательско-полиграфическое предприятие, CRM-систем, системы поддержки принятия решений издательско-полиграфических предприятий.*

1 Introduction

The functioning of a company in a market economy requires appropriate changes in its structure. The process of transition to a new company structure should be focused on a customer-oriented approach. This requires a detailed analysis of customer-oriented technologies in the context of relations between a printing company and its stakeholders. The introduction of a customer-oriented approach in a printing company requires harmonization of the relationships between stakeholders and a printing company which is a complex time-consuming process and requires the appropriate methodological support.

2. Formulation of the purpose of the article, setting the task

Object of research: stakeholder-printing company relationships.

Subject of research: a prototype of a decision support system for an effective stakeholder-printing company relationship.

Purpose of research: to develop the technology of establishing a stakeholder-printing company relationship.

To achieve the stated purpose, it is necessary to analyze the methods used to establish relations between stakeholders and a printing company; describe the procedures used in the stakeholder-printing company relationship; to develop a strategy of effective market positioning of a printing company and to provide the recommendations to a company in order to achieve leading positions in the market of printing services.

3. Presentation of the main material

Each operation in the full cycle of the technological process of manufacturing a printed product, whether it be the process of ordering printing materials or other technological operations is a necessary component of the economic activity of a printing company, as even a slight deviation of any operation from the norm can disrupt the whole cycle and, as a consequence, lead to the reduction of product quality, the lack of orders, or failures in the supply chain.

Nowadays it is very important for printing companies to implement the efficient procedures in the stakeholders-printing company relationships. The key points in this process are the stages of quality control, which should be agreed with stakeholders. The process of identifying (specifying) the needs of the customer largely determines whether the client will be satisfied with the results of cooperation with the service provider for program and project management. Having a clear idea of the problem allows you to solve it in a short time and at the lowest cost. The quality of a product or service and its value to the customer depends on how precisely the needs, that this product or service must meet, have been identified [6].

The modern market, including the market of printing materials, is highly competitive. It is very difficult to increase the competitiveness of a company by improving the quality of goods and services, because this path is usually associated with a significant increase in production costs and, therefore, with raised production prices, which can lead to the opposite effect – the loss of customers. In terms of equalizing the quality of goods and services offered by different companies, the most effective way to attract attention is an individual approach to each customer [4].

In the current economic situation, the effective relationship between a printing company and its stakeholders requires optimization of workhours and working personnel. These tasks can be solved by means of introducing the decision support systems for printing companies. That will increase the speed of data processing and allow making the reasonably correct decisions.

Complexity of decision-making lies in the necessity to take into account the various and complex processes, such as business investment, production, financial, management etc., as well as the numerous indicators of the external and internal market environment. Therefore, a decision maker faces complex challenges, the effective solution of which is impossible without the use of a systematic approach [8].

The business relationships have been recently characterized by the dominance of customer-oriented approach, the main purpose of which is to build individual relationships with all customers, suppliers, partners and other stakeholders. Therefore, this approach involves retaining stakeholders, establishing individual approach to stakeholders, as well as the cooperation with stakeholders, which is based on relationships.

Thus, in today's economic environment, the process of attracting new customers, partners and other stakeholders is very expensive for a printing company, so it is much more profitable for a company to use the consuming potential of the existing client base in order to increase sales of its products. Calculation, maintenance and accounting of each stakeholder's personal data requires the implementation of the technological process of printing enterprise information system such as DSS with the elements of CRM to provide personal interactive relationships between a stakeholder and a company.

The analysis of the latest research and publications shows that S. Apelbaum [1], D. Ling, R. Ian [2], Mukhortova O. [9], Mann I. [7], Vorzhakova Yu. 3], Zinkevich A. [5] pay great attention to the issues of customer-oriented approach for enterprises. Scientific researches of I.I. Bazhin, S.B. Arsenyev, V.B. Britkov, H.A. Salnikov have considerably developed the systems management theory of enterprises' relations.

Most existed automated systems embrace only some aspects of automating the technology of the stakeholder-printing company relationship; relationships with the customers, for example, but none of them allows making informed, accurate decisions concerning relations with stakeholders.

An overview of CRM class systems (Table 1), which allows solving certain problems of the stakeholder-printing company relationship effectively, has made it possible to identify functions that can be used in the prospective information system. Most of the CRM systems considered have a standard set of functions and allows creating and maintaining a client base, creating and tracking tasks etc. All these functions do not allow user (stakeholder) to make informed decisions, such as the choice of materials for the order, order management, and other printing-related parameters.

Table 1. Review of CRM-systems presented in the Ukrainian market that can be used in printing production

CRM systems	Areas of usage	Functions
Oracle Siebel CRM	Production. Service Industries	SMS notifications. Client base. Business processes. Task management. Marketing tools. Integration with mail. Access settings. Reports. Billing and payment system. Statistics
PERFECTUM CRM	B2B. Call centers. Sales departments. Production. Retail departments. Service Industries	SMS notifications. Call analysis. Analytics. Client base. Document flow. Task management. Order management. Integration with IC, mail, telephony. Mobile application. Call center module. Reminder. Access settings. Polls and notes. Reports. Billing and payment system. Warehouse accounting. Statistics.
SAP	Sales departments. Service Industries	Analytics. Client base. Business processes. Sales funnel. Document flow. Task management. Marketing tools. Integration with mail, telephony. Mobile application. Reminder. Reports. Predictions. Statistics.
TEAMWOX	B2B. Call center module. Sales departments. Production Services	Analytics. Client base. Sales funnel. Document flow. Task management. Order management. Access settings. Billing and payment system. Document editor. Order management. Financial Accounting
BLOKNOTAPP	Sales departments. Service Industries	Client base. Sales funnel. Appointment. Integration with mail. Calendar. Reports. Statistics. Order management. Financial Accounting

APPTIVO CRM SYSTEM	Sales departments.	Client base. Business processes. Sales funnel. Document flow. Task management. Order management. Integration with mail. Reports. Billing and payment system. Document editor. Order management. Financial Accounting
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However, automated systems have a number of disadvantages: 1) the systems do not take into account the operating technologies of the customer-printing company relationship as a whole, and allow solving only specific local problems; 2) most automated systems do not allow implementing a customer-oriented approach due to the focus on certain features of the technological process; 3) none of the systems presents reasonable decision-making support on the customer-printing company relationship.

The usage of decision support systems with the elements of CRM-system in the printing industry will solve a number of issues a stakeholder faces. But first of all, it allows increasing the competitiveness.

Competition between printing companies is intensifying every year in the Ukrainian market. In the current economic situation, market conditions are constantly changing, the number of small printing companies (operational printing) is growing, and the equipment is able to perform a variety of printing services. The struggle for the customer, supplier and stakeholder is becoming more intense.

Competition as an economic category is a struggle between producers for the most favorable conditions of production and sale of goods and services, for the appropriation of the largest profits. Competition acts as a regulator of the pace and volume of production, encouraging the manufacturer to implement scientific and technical advances, increase productivity, improve technology, labor organization, etc. [2]

No printing company today can afford to ignore the increasing competition, therefore, for achieving stable position in the market it is necessary to identify the advantages of the company over competitors, to establish the factors of competitive success.

Ensuring long-term competitiveness of a printing company should become the priority in the value system of an enterprise. Identifying the factors of competitiveness, managing these factors will form the main effort in increasing the competitiveness of the enterprise.

The four main approaches to the concept of "enterprise competitiveness" are identified in [10]: as a certain ability, capacity or capability of the enterprise; as a complex, relative or comparative characteristic of the business entity; as a property or possession of certain properties; as an assessment of total competitive advantages.

There are several reasons that can negatively affect the long-term competitiveness: the enterprise management system does not work properly, focusing on short-term relationships; insufficient market analysis; inefficiency of management and cost management systems; the decisions concerning the enterprise do not always lead to the desired result.

Conducting a comprehensive study in the field of competitiveness management of a printing company and creating a methodology will ensure the successful establishment of its long-term competitiveness and provide a company with a number of advantages. Currently, the specifics of the problem of a printing company competitiveness have not been sufficiently considered.

There is a need to identify all factors of a company's competitiveness. Therefore, creation of the methods and tools to ensure the development of printing companies and increase its long-term competitiveness is relevant and in great demand.

To perform the analysis of a printing company and determine the level of its competitiveness in the market of printing services, it is necessary to determine the intensity of relationships with customers:

$$I_B = \sum_{i=1}^N \frac{3}{n} \quad (1)$$

where 3 – the number of a company's delivered orders, the quality of which have been assessed by a stakeholder together with a printing company;

n – is the total number of orders.

The analysis of sales of the printing company has revealed that the intensity of the relationship with stakeholders is expressed in the frequency and monetary equivalent of orders. The intensity of relationships with stakeholders allows forming a client base and ensuring a stable demand. Thus, strengthening relations with suppliers, for example, increases the competitiveness and loyalty of stakeholders. The identified interdependence of factors allows determining the factors that characterize

the competitiveness of a printing company, such as relationships with stakeholders that affect the strategic position of the company.

The competitiveness and the efficiency of a printing company also depends on how effectively a company uses the latest technologies, so such a factor as technical equipment of a company should be taken into account. Technical equipment of a company can be calculated by the formula:

$$K_c = \frac{K_{\text{БП}}}{\Pi_0} \quad (2)$$

where $K_{\text{БП}}$ – is the number of the new technologies implemented by a printing company in the last year;
 Π_0 – the total number of a printing company equipment.

Comparing the indicators I_B and K_C , we can assess the capabilities of a printing company, using the matrix shown in Fig. 1.

Intensity of the relationship with a customer		High ($0,5 \leq \mu \leq 1$)	I	IV
		Low ($\mu < 0,5$)	II	III
			Low ($0,5 \leq \theta$)	High ($0,5 \leq \theta \leq 1$)
			Level of technical equipment	

Fig. 1. Matrix for assessing the capabilities of a printing company

The capabilities of a printing company can be determined by the position in the quadrants of the assessing matrix: I – the company has a significant advantage in the printing market, so to maintain current level of competitiveness it is necessary to have active contacts with stakeholders; II – it is necessary to improve relations with stakeholders by introducing innovative technologies and invest into the latest technical equipment; III – a company should review the direction of its activities and order appropriate printing equipment; IV – modern technical equipment allowed a company to reach the current level of the quality of service. A company should initiate marketing activities that will attract potential customers and improve its relationships with stakeholders. The usage of the matrix makes it possible to position the printing company in accordance with the effectiveness of the customer-oriented approach.

4. Conclusions

A printing company succeeds if it focuses on stakeholders, on the customers in particular, ensures a high level of product quality and uses the latest management methods. Satisfaction of customer requirements is the main task of modern printing companies in achieving their goals. Usage of perfect technologies of relationships between a printing company and a stakeholders will ensure the competitiveness, which is one of the crucial factors of the company success. The implementation of the technology of the stakeholders-printing company relationship based on CRM-system in the company's technological process provides the competitive advantage. Therefore, we are planning to develop the decision support system with the elements of CRM-system, which can be used to make informed decisions about the cooperation of printing companies with stakeholders.

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