

2.4. SELECTION, IMPLEMENTATION, IMPROVEMENT, AND ECONOMIC EFFICIENCY EVALUATION OF CRM SYSTEMS OF TRADE ENTERPRISES

Trading is an important branch of the national economy, as it plays a key role both in the formation of economic potential of society, as well as meeting needs of consumers in consumer goods and services. Also, it provides maintaining a balance between production and consumption, formation of a significant share of gross added value, employment of economically active population (Bilotserkivskiyi, 2020). However, in the market conditions effective trade activity is impossible without timely, reliable and complete information. That's why it is necessary to implement information systems and technologies in trading, the purpose of which is to increase the efficiency of trade enterprise management and, as a result, the sales volume increasing and profit growth. This effect is achieved by two factors such as operational accounting and continuous control over the movement of goods and material values on the one hand, on the other hand, implementing CRM technologies that allow attracting buyer and significantly increasing competitiveness of enterprises (Bilotserkivskiyi, 2019). However, in the trade industry of Ukraine, CRM systems and technologies are almost not used: in 2020 only 15-20 % of Ukrainian enterprises actively used CRM systems. That's why the questions of selection, implementation and improvement of CRM systems for trade enterprises management are relevant and have important practical significance. The concept of customer relationship management (CRM) has been known since the early 1970s, when satisfaction of consumers was evaluated by annual surveys or direct inquiry. Customer relationship management was popularized in 1997 thanks to the work of Siebel, Gartner and IBM. Therefore, at the end of 1990s and at the beginning of this century, companies initiated large-scale investments to CRM systems. Most managers believed that these systems would allow them to expand business processes and thus improve to their business performance. However, according to Gartner, 55 % of implemented CRM systems couldn't achieve the expected results. Therefore, in the world practice of scientific research-intensive work is being done to solve the problems which arise when CRM systems are implemented to enterprises activity (Deulina et al., 2018, Zehetner et al., 2011, Ivanovic et al., 2011). In addition, the problem is an informed selecting the CRM systems for trade enterprises management because the first ratings of CRM system, compiled by different authors, may differ from each other, so, for the final choice of the CRM system, the author proposes to select ratings of only those CRM systems that are used in the practical activity of Ukrainian enterprises, and using an expert method to check the degree of consistency of experts' opinions regarding these systems. The author considered only those CRM systems that were recognized as the main players in Ukraine, including Terrasoft Creatio, Bitrix24, AmoCRM, and Megaplan. Using the expert method, it was checked the degree of consistency of experts' opinions on these systems and selected the most optimal system. For this, the methodology of rating assessment was adapted to CRM systems, i.e. the system of indicators characterizing the functionality of the CRM system was compared with a conditional CRM system that has the best results in all the compared indicators.

To process data from many sources, an expert method based on the generalized experience and intuition of expert specialists has been used. Algorithm of the expert method consists of the following steps (Bilotserkivskiyi, 2019):

1. All the CRM systems are numbered arbitrarily.
2. Experts rank systems on a scale of order.
3. Ranked series of systems compiled by experts are compared.

4. The sums of the ranks of each system are determined.
5. On the basis of the received sums of ranks, a generalized ranked series is built.
6. Generalized expert quality assessments of these systems are calculated, i.e. their weighting coefficients are determined.
7. Kendall's concordance coefficient is determined, on the basis of which conclusions are made about the consistency of experts' opinions. If Kendall's concordance factor is zero, then absolute inconsistency of experts' opinions is observed; 1 – complete agreement of opinions; less than 0.2÷0.4 – weak consensus of experts; more than 0.6÷0.8 – strong consistency of experts.
8. The significance of the Kendall concordance coefficient is checked based on χ^2 -the Pearson test, which is compared with tabular value χ^2_{cr} . If $\chi^2 > \chi^2_{cr}$, then the coefficient of concordance is significant and there is a strong relationship between formulated signs.

The ratings of CRM systems according to data (Bilotserkivskiy, 2019) are shown in Fig. 1. For calculations the advanced analytics software package "STATISTICA" was used.

| | 1 Terrasoft Creatio | 2 Bitrix24 | 3 AmoCRM | 4 Megaplan |
|---|------------------------|---------------|-------------|---------------|
| 1 | 2 | 1 | 3 | 4 |
| 2 | 1 | 2 | 4 | 3 |
| 3 | 1 | 2 | 3 | 4 |
| 4 | 1 | 2 | 3 | 4 |
| 5 | 1 | 2 | 3 | 4 |
| 6 | 1 | 2 | 3 | 4 |

Figure 1. Initial data

Results of calculations using expert method are shown in Fig. 2.

| Friedman ANOVA and Kendall Coeff. of Concordance (Spreadsheet1) | | | | |
|---|--------------|--------------|----------|-----------|
| ANOVA Chi Sqr. (N = 6, df = 3) = 16,00000 p = ,00113 | | | | |
| Coeff. of Concordance = ,88889 Aver. rank r = ,86667 | | | | |
| Variable | Average Rank | Sum of Ranks | Mean | Std. Dev. |
| Terrasoft Creatio | 1,166667 | 7,00000 | 1,166667 | 0,408248 |
| Bitrix24 | 1,833333 | 11,00000 | 1,833333 | 0,408248 |
| AmoCRM | 3,166667 | 19,00000 | 3,166667 | 0,408248 |
| Megaplan | 3,833333 | 23,00000 | 3,833333 | 0,408248 |

Figure 2. Results of the expert method

As follows from Fig. 2, the value of the concordance coefficient $\chi^2 = 0.89$ indicates a strong agreement of experts' opinions.

Compare χ^2 -Pearson's criterion value equals to 16 with the critical value. If $16 > 11.07$ then the concordance coefficient is significant and there is a strong relationship between the considered attributes.

Thus, according to the rating, CRM systems are located in the following order: 1) Terrasoft Creatio, 2) Bitrix24, 3) AmoCRM, 4) Megaplan (Fig. 2).

Implementation is the stage that completes creation of information systems. It involves holding all the organizational and technical measures for preparation and implementation of the main

statements formulated in the technical task and developed in the technical and project documentation (Nedashkivskiy, 2014).

Before implementing new information systems, it is necessary to think and to make a decision based on such basic questions (Karminskiy et al., 2012):

1. How is the current information system built and how does the document flow work?
2. What urgent tasks are not solved or solved not effective enough within the framework of the current information system and document flow?
3. How should the more rational information technology built?
4. Can the current system be improved, or is it necessary to replace it with a new one?
5. What software systems (packages of application programs) can ensure the implementation of the recommendations received in the third and fourth points?
6. Is there the similar standard (box) software in the market?
7. What special tasks will require refinement or targeted development (programming) due to the specifics of the enterprise's business processes?
8. What new hardware is needed to build a new information system?
9. What is the approximate total cost of products and services that will be acquired during the building the new information systems?
10. What technical and economic effect is expected from construction or reorganization of the company's information system?

Analysis of literary sources has showed that there are no universal recommendations for implementation and improvement of trade enterprises management information systems. Research on this topic can be divided into three groups of recommendations:

- 1) general recommendations for implementation and improvement of enterprises management information systems based on GOST 34.601-90 "Information technology. Complex of standards for automated systems. Automated systems. Stages of creation" and other standards;
- 2) measures related to implementation and improvement of information systems at enterprises of specific industries of economy, in particular trading;
- 3) recommendations for implementation and improvement of the customer relationship management systems (CRM systems) at the various enterprises.

In my opinion, the process of implementation and improvement of the CRM system can be divided into three stages:

- 1) the preparatory stage;
- 2) the stage of implementing the CRM system at the trading enterprise;
- 3) the stage of improving the current CRM system.

Consider the recommended measures more detail.

The preparatory stage includes the development and adoption of strategies, strictly focused on the buyer, changing of internal structure, business processes and corporate culture at the trading enterprise. Then you need to describe the business processes and coordinate them with the company's management. It is also possible to propose optimization of certain processes and to clarify all controversial questions. After that, calculate the profitability of implementation of the CRM system, justify the need of implementation of the CRM system, set the technical task. Finally, choose the platform that will meet the criteria and budget of the project, taking into account the possibility to adapt the CRM system according to the criteria: ease of learning and mastering; integration with established enterprise systems of other orientation; possibility of remote work; program update; convenient support of CRM system. Small business companies prefer the most economical options of automation and pay attention not only to the cost of implementation, but also to the cost of further maintenance and expansion of the CRM system. Therefore, using the cloud technology allows you to quickly implement

the CRM without capital costs and to independently configure the system. Moreover, the cloud CRMs do not require technical administration by the client. They are easily scalable and accessible from anywhere the world where there is access to the Internet.

The stage of the CRM system implementation consists of the following processes, such as installation of the CRM system; setting the data exchange with others systems; transportation of the client base to the CRM system from the programs of MS Excel, MS Outlook, and MS Access; setting the CRM interface, as well as adaptation to specifics of business processes flow at the enterprise; teaching employees to work with the CRM system. At the same time, it will be necessary to attract a specialist for the CRM systems who will help to solve problems when working with the new CRM system.

The stage of improvement of the current CRM system includes collection and analysis of user recommendations for preparation of requirements that will be taken into account in system updates. Then, it's necessary to use the updated CRM system, taking into account the permitted errors or defects. At the same time, further improvement of the CRM system should be aimed at solving such problems:

- a) the need to record every incoming call and every single lead request, to automate receipts, accumulation of information about requests, sales and customers;
- b) accumulation of information at the enterprise from various sources, formation of a statistical base, which will allow the manager to make decisions and to plan the further work of the enterprise;
- c) improving and optimizing the work of the sales department, because, by installing a CRM system, the owner receives not only the product and work tools, but also the vision of the suppliers of software product on how the sales department should work.

To improve the current CRM system, the following measures should be carried out:

- a) modernization of technical means and collection of technologies, transmission, processing, and storage of information;
- b) increasing the professional level of managers and other employees who carry out collection, transfer, processing, and storage of information;
- c) improving the information support organization of management activity with the purpose of creating an innovative information system.

Prospective directions for improving CRM systems at the trading enterprise include implementation of the Social CRM systems (CRM systems integrated with social networks), using mobile applications and gamification.

There are the following global trends in the development of the CRM system market, such as (9): 1) offering by CRM manufacturers web tools based on subscription (cloud computing) and SaaS; 2) equipping CRM systems with mobile capabilities, which makes the information available to the remote trader personnel; 3) expanding the rights and opportunities of sales managers; 4) vendor relationship management (VRM) provides tools and services that enable customers to manage their individual relationships with suppliers; 5) creation of individual teams of success with clients at enterprises and assigning management tasks to them existing relationships with clients.

The final stage of the research is the evaluation of the economic efficiency of the implementation of this CRM system into trade enterprises' activity. The analysis of literary sources showed that all methods of assessing the economic efficiency of CRM systems are divided into three groups, such as methods of financial analysis, methods of qualitative analysis, and methods of probabilistic-statistical analysis. First, let's define the effectiveness of the information system. The effectiveness of the information system (IS) has been defined as the property of the IS to perform the set of goals and tasks (functions) under the given conditions and with the given quality (Netsvetaiev, 2014). It is determined by a comparison of the results obtained from the activity of this system and the costs of all types of

resources necessary for the creation, implementation, and development of this system (Rohoza, 2014), and with regard to the CRM strategies by increasing the effectiveness of sales management (Volontyr et al., 2019). Let's consider more detail the approaches to assessing the economic efficiency of implementing CRM systems. Economic efficiency is the measure of the profitability of economic costs for the creation and using of the system (Rohoza, 2014).

The methods for assessment of the economic efficiency can be divided into three groups:

1) methods of financial analysis including Return on Investment (ROI), Accounting Rate of Return (ARR), Net Present Value (NPV), Internal Rate of Return (IRR), Rapid Economic Justification (REJ), Economic Added Value (EVA), and Total Cost of Ownership (TSO);

2) methods of qualitative analysis, such as Benchmarking, Consumer Perception, Balanced Scorecard (BSC), internal rate of return (BITS), Information Economy (IE), Portfolio Management (PM), Activity-Based Costing (ABC), and Total Economic Impact (TEI);

3) probabilistic-statistical methods of analysis including Real Option Valuation (ROV), Applied Information Economy (AIE), Economic Benefit of Resources (EVS) and others.

Let's conduct a comparative analysis of three groups of methods (Table 1).

Table 1. Comparative analysis of three groups of methods for evaluating the economic efficiency of information systems

| Group of methods | Advantages | Disadvantages |
|-----------------------------------|--|--|
| methods of financial analysis | they include basic principles of the classical theory for determining economic efficiency. Also, these methods allow to evaluate the economic parameters of the implementation and application of the information system by analogy with the evaluation of the investment project | they take into consideration only financial and economic indicators, without the influence of long-term organizational, infrastructural, socio-psychological, and similar results |
| methods of qualitative analysis | they complement quantitative calculations that will help us to evaluate all factors of the information system effectiveness and to agree them with the general strategy of the company. In addition, these methods allow to evaluate the investment into the information system by some quantitative indicators, such as success and failure | in many cases, these methods are based on expert judgments and assessments, but they are used as a component, not a key model |
| probabilistic-statistical methods | they allow to assess the probability of risk occurrence | their use is impossible without the collection of statistical data, which is a difficult, cumbersome, and costly task in terms of financial, time, and human resources. Also, it is necessary to fulfill the conditions of representativeness of the samples, validity of individual available estimates |

Source: Bilotserkivskiy, 2020.

As follows from the Table 1, each group of methods has limitations in use, so it is necessary to apply a combination of several methods. Therefore, the author proposes to supplement the given classification with a fourth group of methods, which is called modified.

According to many foreign and domestic scientists, methods of ROI, TCO and NPV are the most popular for evaluating the economic efficiency of the implementation of the CRM systems.

Return on investment (ROI) is defined as a ratio between net income obtained due to the implementation of the CRM technologies and investment:

$$ROI = \frac{P_{crm} - P}{Z} \cdot 100\%, \quad (1)$$

where P_{crm} is the profit received by the company when implementing the CRM; P is the profit obtained without the implementation of the CRM; Z are the project implementation costs.

However, there exist difficulties in determining Z , since the costs, in addition to the payment for software licenses (software), additional equipment and the services of third-party consultants, also include the salary of employees employed in the implementation process. But the main problem is that the estimate obtained by the ROI method is not entirely reliable, since it is necessary to take into consideration that the costs of project implementation do not stop after its formal completion.

But there is a more adequate method for calculating the cost part, namely determining TCO (Total Cost of Ownership). This technique allows business managers to calculate the direct and indirect costs and benefits associated with any component of information systems. The TCO indicator is determined by the formula:

$$TCO = TCOp + TCA, \quad (2)$$

where $TCOp$ is the total cost of use, TCA is the total cost of direct implementation costs.

For the actual calculation of $TCOp$ in the company, they are classified into several categories:

1) costs of human resources (people costs) include costs of salaries for both lower-level executives and top-level management;

2) the cost of the environment includes costs for heating, electricity and other communal services, the Internet;

3) the cost of support, for example, IT company has to purchase new computers and regularly update the software;

4) expenses of another plan, for example, expenses for the integration of the security system or the organization of trainings to improve the qualifications of personnel.

Direct costs (TCA) include capital costs (hardware and software), information system management costs, technical support costs, in-house software development costs, outsourcing costs, travel costs, and communication service costs.

However, the TCO calculation method does not take into consideration the company's business strategy and risks.

The main criterion for implementing the CRM system is the NPV indicator (Net Present Value).

$$NPV = \sum_{i=1}^n \frac{P_i - B_i}{(1+r)^i} > 0, \quad (3)$$

where P_i are the results obtained for the i -th period; B_i – expenses received for the i -th period; r is the discount rate; n is the number of years of the life cycle of the CRM system.

NPV has the same disadvantage as TCO because it doesn't take risks into consideration. Therefore, to eliminate this drawback, the author suggests using the method of simulation of the investment projects risks which enables to calculate the main indicators of investment risk, such as mathematical expectations, variances, root mean square deviations, coefficients of variation of the

variable parameters of the investment project, and NPV. Before conducting the simulation tests, it is necessary to set the probability distribution laws for the key parameters of the investment project.

Thus, the author proposes to evaluate the economic efficiency of the implementation of the CRM systems into trading enterprises activity using indicators such as TCO and NPV.

The research results have the following methodological and practical value:

1) Based on the expert method, methodical approach to quantitative assessment and selection of CRM systems uses ratings of information systems as output data, composed by different authors, will allow trade enterprises to choose the most optimal information systems among those existing on the Ukrainian market, which will save money and time for development, implementation and certification of own information systems or search of existing information systems.

2) Recommendations for implementation and improvement of the CRM-system of the trading enterprise management allow entrepreneurs to implement and improve information systems at trading enterprises independently from the form of ownership.

3) Research results may not be used only at trade enterprises to increase efficiency activities due to the automation of business processes, but also at enterprises of other branches of the economy of Ukraine.

4) The methods of economic efficiency assessment for CRM systems implementation, which are recommended by foreign and Ukrainian scientists, are considered. They include methods, such as ROI, TCO, and NPV. But these methods have some disadvantages. The ROI estimate is not entirely reliable since the project implementation costs are not stopped after its formal completion. Methods of TCO and NPV evaluation don't take risks into consideration. To remove the drawback of NPV method, the author has proposed to use the technique of simulation risk modeling of investment projects.

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