

dealer-service center, BSC method, system analyses

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DEALER-SERVICE CENTER COMPETITIVENESS INCREASE USING MODERN MANAGEMENT METHODS

Summary. In article the method of a management automotive company dealer -service network by application of decision-making allowing support system on the basis of network subjects functioning indicators analysis and comparison of their values during the previous and present periods to develop the decision in the field of spare parts deliveries optimization is offered.

ПОВЫШЕНИЕ КОНКУРЕНТОСПОСОБНОСТИ ДИЛЕРСКО-СЕРВИСНОГО ЦЕНТРА С ИСПОЛЬЗОВАНИЕМ СОВРЕМЕННЫХ МЕТОДОВ УПРАВЛЕНИЯ

Аннотация. В статье предлагается метод управления дилерско-сервисной сетью автомобилестроительного предприятия путем применения системы поддержки принятия решений, позволяющей на основе анализа показателей функционирования субъектов сети и сравнении их значений в предыдущий и настоящий периоды вырабатывать решения в области оптимизации поставок запасных частей.

1. INTRODUCTION

One of the requirements to make the motor-car producer competitive is to perfect its firm car service system. The necessity of the firm service primarily relate to aspiration of firm-manufacturer for forming a stable market for its output both in Russia and abroad. Taking into account durable consumption articles which includes the automotive engineering and it's science linkage and advanced technology, high-quality service allows to increase the competitiveness, gain confidence of brand, which stabilize demand forming it's segment on sales market. Creation of the competitiveness firm service system and its effective functioning support nowadays is the question of the day for motor-car manufacturers of Russia.

According to one of ISO conceptions the competitiveness specifies as sum of perceivable by consumer qualities and product cost correlation, i.e.

$$Competitiveness = \frac{\sum CC}{Cost} \quad (1)$$

where $\sum CC$ is a sum of the product (service) consumer characteristics which occurs the great value for consumer and include objective emotional characteristics of an article. As for automotive engineering, the characteristics of the 1st group are weight-carrying capacity, fuel consumption, reparability of a

unit, usability, availability or absence of advanced service infrastructure; the characteristics of the 2nd group are driver's worksite comfort, design, roadability and productivity.

According to given formula increasing of discharged production competitiveness can be reached either at the expense of the article consumer characteristics increasing or at the expense of its full cost decreasing (i.e. material costs of production, maintenance, after-sales service and utilization decreasing).

The competitiveness of such a product like automobile evaluates by degree of engineering solution conformity to the set of consumer requirements (expectations), i.e. by the product quality. Besides, consumer's choice is under the influence of such a factor as availability of advanced service network which provides the possibility of durable exploitation and which is especially important in time of revenue service of trucks.

The quality conformance of declared characteristic to service data can be evaluated only in the course of real-life environment maintenance which is detected using information of calls to service centers. The decreasing of consumer's costs of automotive engineering service support and after-sales service quality increasing can be reached by the processes optimization in the firm service system.

The service policy in many advanced countries suppose the firm selling the motor-car vehicle guarantees it's service support and operative original spare parts and accessories provide. The latter assumes availability of optimally designed dealer-service network (DSN) as well as continuous monitoring of its functioning using effective mechanism of feedback for the purpose of parameters adjustment and science-based administrative decision making using stored statistical information.

Thus the problem of today for firm service enterprises is an organization of daily reactivity for increasing flow of calls. One of the ways of firm service system efficiency increasing is organization of effective cooperation with procurement system, i.e. creation of unified information-logistical area that allows to make an objective estimation of the spare parts requirements and bring its availability to conformity with firm service system requirements.

2. PROBLEM DEFINITION

In present-day conditions the quality of functions connected with the dealer-service centers (DSC) activity planning, the spare parts requirements satisfaction, material resources structuring and redistribution, which are implemented on a level of the DSC control center, depends on the quality of the data flow about the automobile park kind-age structure and the spare parts requirements forecast in the region of maintenance. While the statistic data are analyzed it is necessary to bring into proper correlation the quantity and the age of automobiles of given model and packaging arrangement in analysis area and amount of defects of concrete article. Derived after analysis data allows to determine intensity of calls on service flow and its qualitative structure, frequency of parts replacements and car owner's average maintenance costs. In order to such data capturing it is required to hale In the system the mechanism of feedback containing which is able to implement the decision-making support in a firm service system based on analysis of data flow from the customer to the motor-car producer and spare parts producer.

In aspect of control flow organization the system of car firm service can be related to adaptive systems with the mechanism of feedback. One of the ways of customers service process optimization in the firm service system is the improvement of the spare parts support system. While the decision-making support system which allows to solve the problem is created the mechanism of feedback optimization necessary appears which allows to make well-grounded administrative decisions and coordinate the subsystems cooperation in the firm service system.

The figure 1 illustrates the scheme of three main subsystems cooperation while a firm system organizes abroad. These three systems are: the support system, the service management system and the service facilitation system. The internal connections between elements of every subsystem and external connections between each of subsystems can be divided into controllable and uncontrollable.

In such a case the service management system is the supervisory subsystem which regulates the data flow (in the form of supervisory influences) and optimizes material flow to achieve the general purpose – the DSN efficiency increasing. The mentioned subsystems cooperation efficiency increasing is especially urgent in conditions of DSN functioning abroad.

The firm service system as any different complex system functions in permanently changeable conditions: a lot of external factors have an influence upon it, many of which are stochastic. At the same time the system parameters are changing too. Under this we can consider that the firm service system is a system with incomplete information, that's why the management of such a system always proceed in uncertain conditions.

The task of the firm service system management as different dynamical system with changeable parameters becomes complicated because of:

- 1) availability of a lot of inputs and outputs;
- 2) inaccuracy of system characteristics measuring;
- 3) difficulty in calculation of required supervisory signal connected with the permanent changes of the system characteristics.

Most systems of this kind cannot be presented using accurate mathematical model. The necessity of such systems management led to creation of new adaptation, education and self-organization theories. And this by-turn led to appearance of complex management systems with the mechanism of feedback, in which computer makes experiments on the system, research its characteristics on-stream and changes the control strategy. We can say that such management systems simulate adaptive ability of the real objects in changeable and undefined environment. Thus adaptive management system require two different operations: the controllable system characteristics identification and the supervisory system parameters adjustment with taking account of controllable one's dynamics.

3. THE FIRM SERVICE SYSTEM EFFICIENCY ANALYSIS

The aforesaid causes the necessity of existing method and models of management by means of spare parts support in the firm service system on the base of detection and its efficiency indicators analysis system.

The effective management method which minimizes the role of subjective factors is decision-making support system (DMSS) which uses the simulation modeling possibilities. The adoptions of such systems improve the efficiency of operative management at average on 10-15%, but based on the strategic planning the economy can achieve up to ten percent from the project cost.

One of the methods which are widely use nowadays assumes the system functioning indicators monitoring and the comparison of its values at the previous and present period. The decision making executes depending on how the indicator's values changed. Implementation of management based on the feedback principle usage is the effective method but such the method does not always reflect the real state of affairs, because when changeable environment the optimal system condition may in due course be expressed by different parametric.

To evaluate facilities of characteristics improvement for the really operating system it is necessary to have a certain reference system while functioning of which the characteristics will have as much as possible values. If we have such information we can construct the control strategy in the direction of improvement of that indicator which has the values below the reference one's and therefore can be improved.

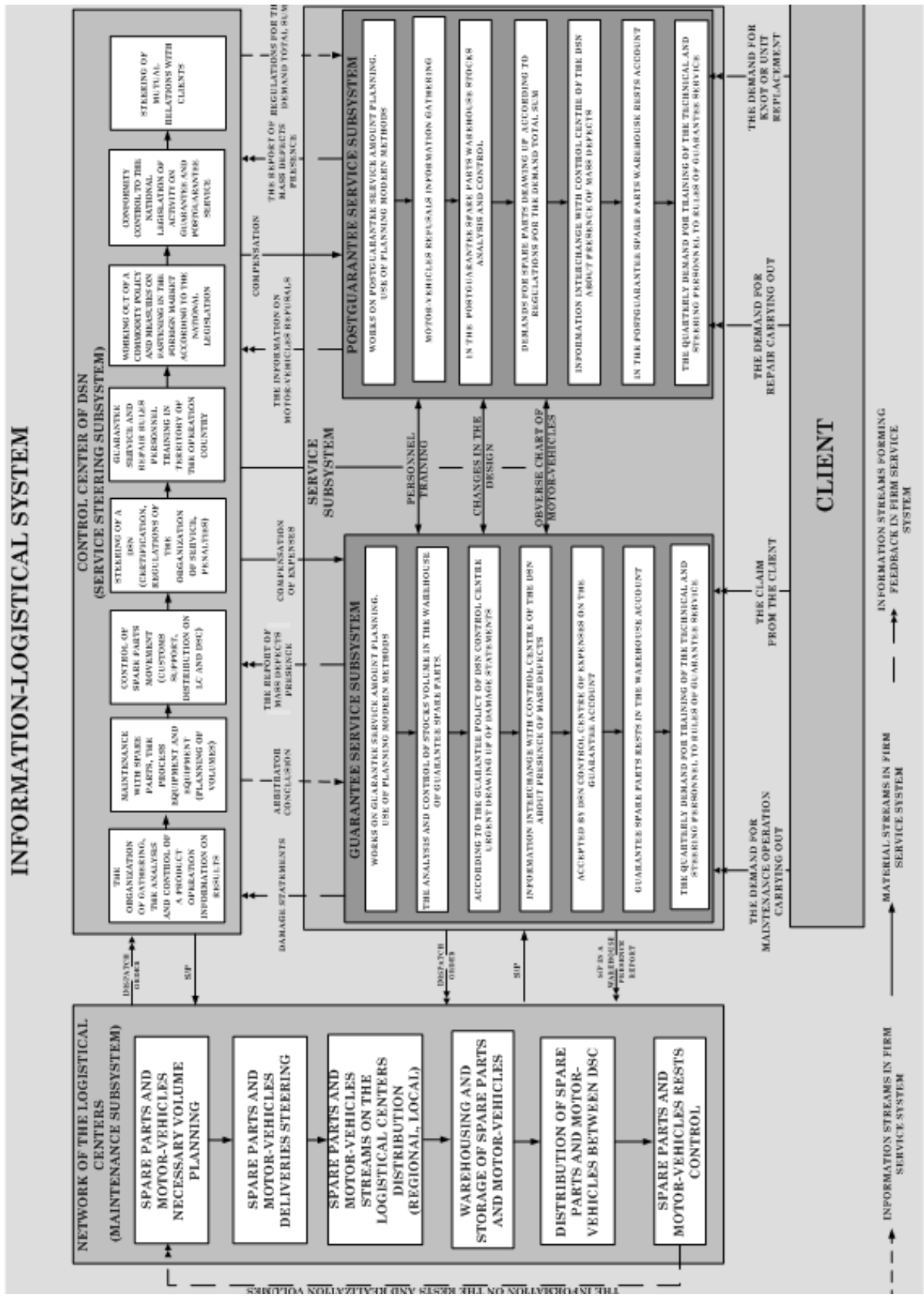


Fig. 1. Information and material flow in the firm service system abroad
 Рис. 1. Информационные и материальные потоки в системе фирменного сервиса за рубежом

In foreign practice it is more frequently used in the methodology of the strategic management adoption most known as Balanced Scorecard system (BSC), which is the system of interconnected goals, critical success factors and key performance indicators. To get such system the cause-and effect diagram is constructing which includes such components as a general company strategy, perspectives, goals and key performance indicators (KPI).

The efficiency of any system management especially such complex as the firm service system to a marked degree determines by the quality of the strategic goal of a system and also by correspondence of local goals of subsystems to its achievement which allows to construct the common strategy of development and improvement of the firm service system. In aspect of the firm service system constructing as the client-oriented system, its strategic goal is the customer service quality improvement which directly influences on the producer’s competitiveness growth. To increase the client’s satisfaction it is necessary to achieve the sum total of goals which are presented in fig. 2.

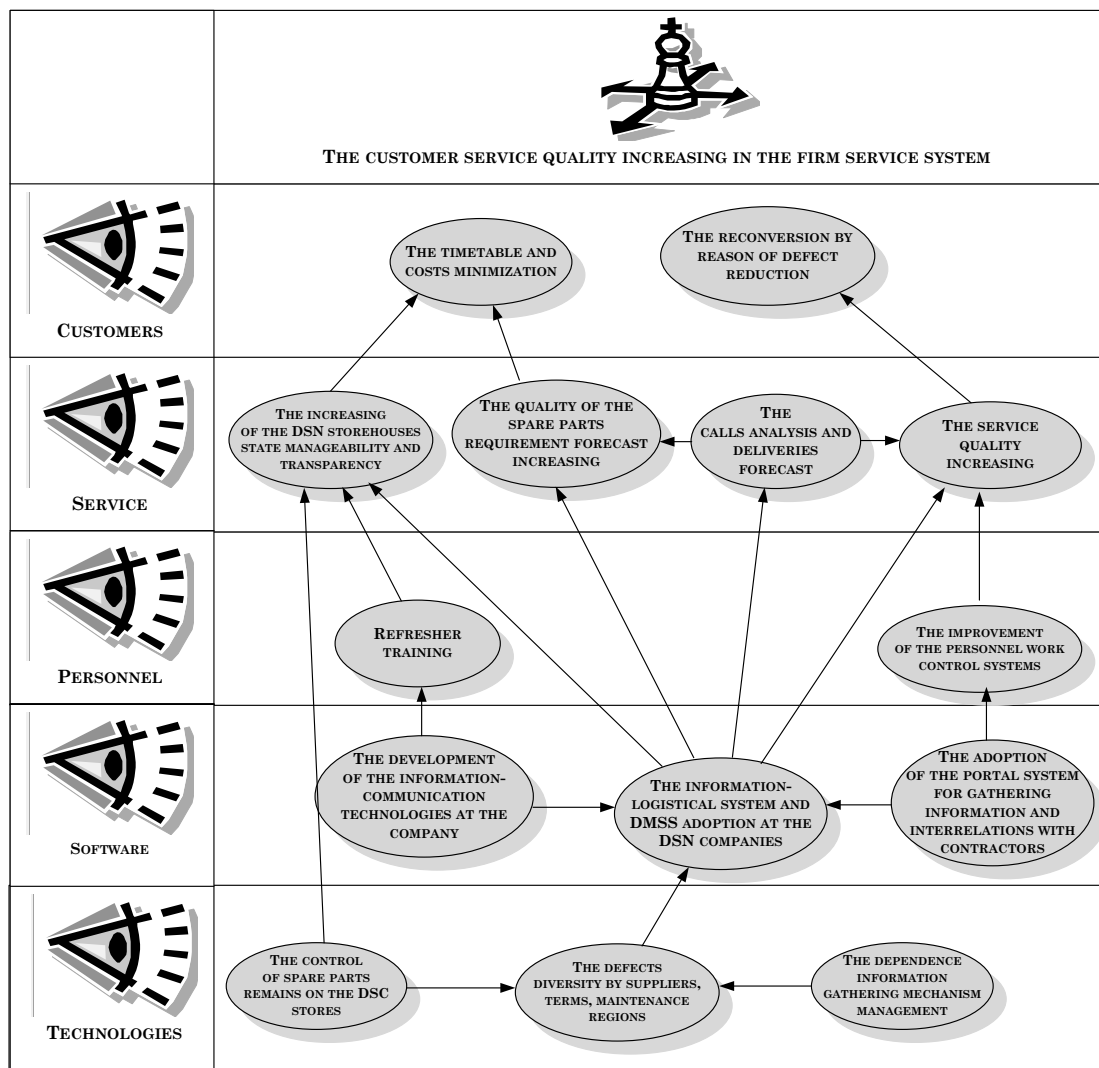


Fig. 2. The cause-and-effect diagram of the firm service system

Рис. 2. Причинно-следственная диаграмма системы сервисных предприятий

The achievement of any goal must be measured by the concrete quantitative indicators. Thus in the BSC methodology the efficiency of any goal’s achievements determines by complex of key performance indicators (table 1).

Table 1

Key performance indicators for the firm service system abroad

Perspective	Goal description	KPI description
1. Customers	1. The timetable and costs minimization	1. Average time to serve the customer
		2. Common service costs
	2. The reconversion by reason of defect reduction	3. Rate of reconversions by reason of defect
		4. Probability of new customers involvement
2. Service	3. The increasing of the DSN storehouses state manageability and transparency	5. Degree of conformity of required spare parts quantity in the DSC warehouse with actual availability
	4. The quality of spare parts requirement forecast increasing	6. The downtime of automobiles on account of spare parts absence
	5. The calls analysis and deliveries forecast	7. Average waiting time if customer while being in queue
	6. The service quality increasing	8. Amount of customers appeals from service
3. Personnel	7. Refresher training	9. Percentage of skilled employees
		10. Percentage of employees which are taking part in innovation development of company
	8. The improvement of the personnel work control systems	11. Skill level of DSN control center employees
4. Software	9. The development of the information-communication technologies in the company	12. Amount of license program copies
	10. The information-logistical system and DMSS adoption at the DSN companies	13. Possibility of employees access to information resources of company
	11. The adoption of the portal system for gathering information and interrelations with contractors	14. Percentage of DSN management tasks automation
5. Technologies	12. The dependence information gathering mechanism management	15. Percentage of tasks which decision is based on accumulated in real-time information
	13. The defects diversity by suppliers, terms, maintenance regions	16. Percentage of workstation of the DSC personnel
	14. The control of spare parts remains on the DSC stores	17. State of material and technical basis
		18. Level of warehouse turnover

The key performance indicators in DMSS can be calculated by means of comparison of their current values with the optimum (reference) ones. At the same time the optimum (reference) KPI values are determining by means of the optimization experiment on the certain region DSN simulation model.

4. CONCLUSIONS

Thus, at strategic planning of spare parts deliveries and carrying out of the processes functioning analysis in motor-car producer dealer-service network it is necessary to consider set of the stochastic factors influencing the work of the system. Complexity of stochastic factors systems subject to influence analysis and modeling of processes, connected with uncertainty, assumes necessity of a possible alternatives taking best choice into account possible losses. In this case the control system of spare parts deliveries should be defined by criterion function and indicators of the activity efficiency. For acceptance of administrative decisions it is necessary to define and analyse efficiency indicators that application of the constructed model gives the chance.

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