

# Algorithm for Making Administrative Decisions in Supply Chain Management at the Stages of “Life Cycle” of Enterprise

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**Abstract-** The present article defines the possibility of optimizing key managerial solutions in business organization based on an improved algorithm of actions that takes into account the stage of “life cycle” of enterprise. The tactics of phased implementation of management decisions at each stage of “life cycle” of the business structure has been clarified and substantiated. This has allowed to reduce the number of out-of-plan adjustments, to break the subsequent implementation of optimized actions short, and to determine the forecast effectiveness of managerial actions based on statistical analysis. The list of indicators that characterize the managerial aspect of the progressive development of the entrepreneurial structure has been systematized. The results of the analysis of data from regional business structures at different stages of “life cycle” confirm the correctness of the choice of indicators. Both marketing and logistical aspects which make it possible in the end to choose the most profitable option of commercial action organically complement the algorithm of managerial decision-making proposed by the authors. In general, this analytical approach to taking into account the dependence of the cumulative effect on the set and mutual influence of factors will provide the flexibility of business organization and shorten the period of achievement of strategic goals.

**Keywords-** *management decisions, supply chain management, business organization, life cycle, algorithm.*

## 1. Introduction

Modern conditions of business organization are characterized by sharpening of competition in many sectors of the market and the volatility of factors in the external environment of the business organization (BO). In order to gain competitive advantages, enterprises, when forming a strategy, strive to take into account the choices for optimizing management decisions under conditions of uncertainty in the parameters of the market environment. One of the objective factors influencing the set of functions of modern management is the peculiarities of “life cycle” (LC) of business organization. As a result, when making key management deci-

sions, business leaders have to adjust actions in order to optimize economic and temporal parameters which significantly affect business efficiency. This article attempts to identify and clarify a set of optimal management decisions at the stages of “life cycle” of business organization.

## 2. Methods

In order to identify the features and patterns in actions to make management decisions at certain stages of “life cycle” of business organization, the methods of conducting marketing research are used: quantitative survey of managers of enterprises on a classified issues and in-depth interviews with managers of procurement development, sales and logistics teams. In making a forecast of the effectiveness of managerial actions based on statistical analysis, the method of correlation and regression analysis is used to form the resulting quantitative indicator. The method of researching operations is also used to closely study the economic systems, in particular commercial entities, in order to identify the best possible indicator.

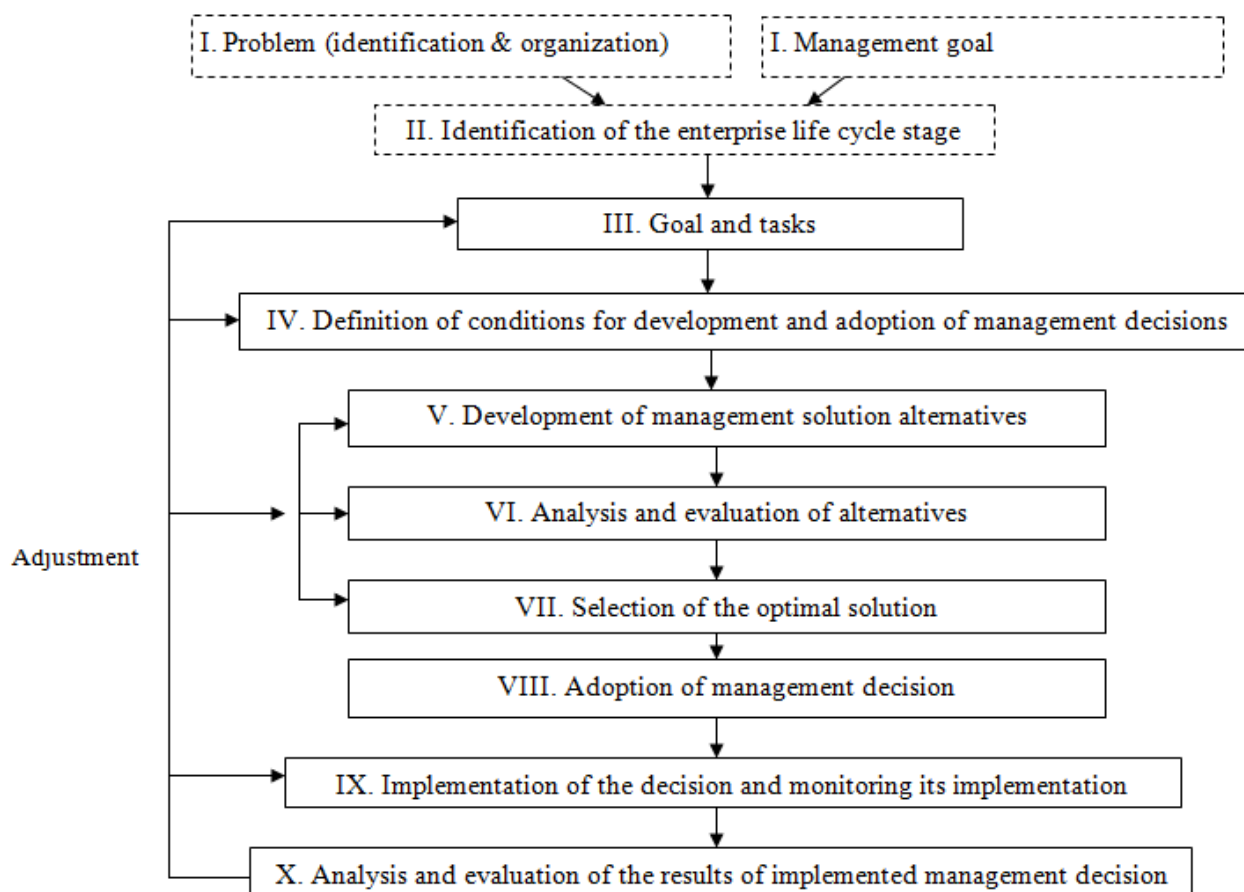
## 3. Results and Discussion

As is well known, market, financial and marketing parameters can significantly change at each next stage of “life cycle” of business organization. In this connection, we will reveal the sequence of stages of making key management decisions in the context of the stages of “life cycle” of the organization. The analysis of the sources of literature on the problem being investigated has revealed that the key areas of business management decision making are organization, finances, marketing, and service staff. The existing approaches to the definition of “management decision”, the classification of decisions made and the formation of management algorithm in various aspects of entrepreneurship activities have several disadvantages, since they do not take into account two main points:

- The priority of using the strategic goal of creating and functioning of the enterprise in comparison with the identified problems in the field of management;

- the peculiarities of the stage of “life cycle” of business organization, which inevitably should lead to the need for prompt adjustment of standard management decisions. The adjustments made as a result of the analysis made it possible to substantiate the tactics for the consistent implementation of the stages of the formation of management decisions in accordance with the features of the life cycle stage of the enterprise. Figure 1 illustrates the algorithm for making manage-

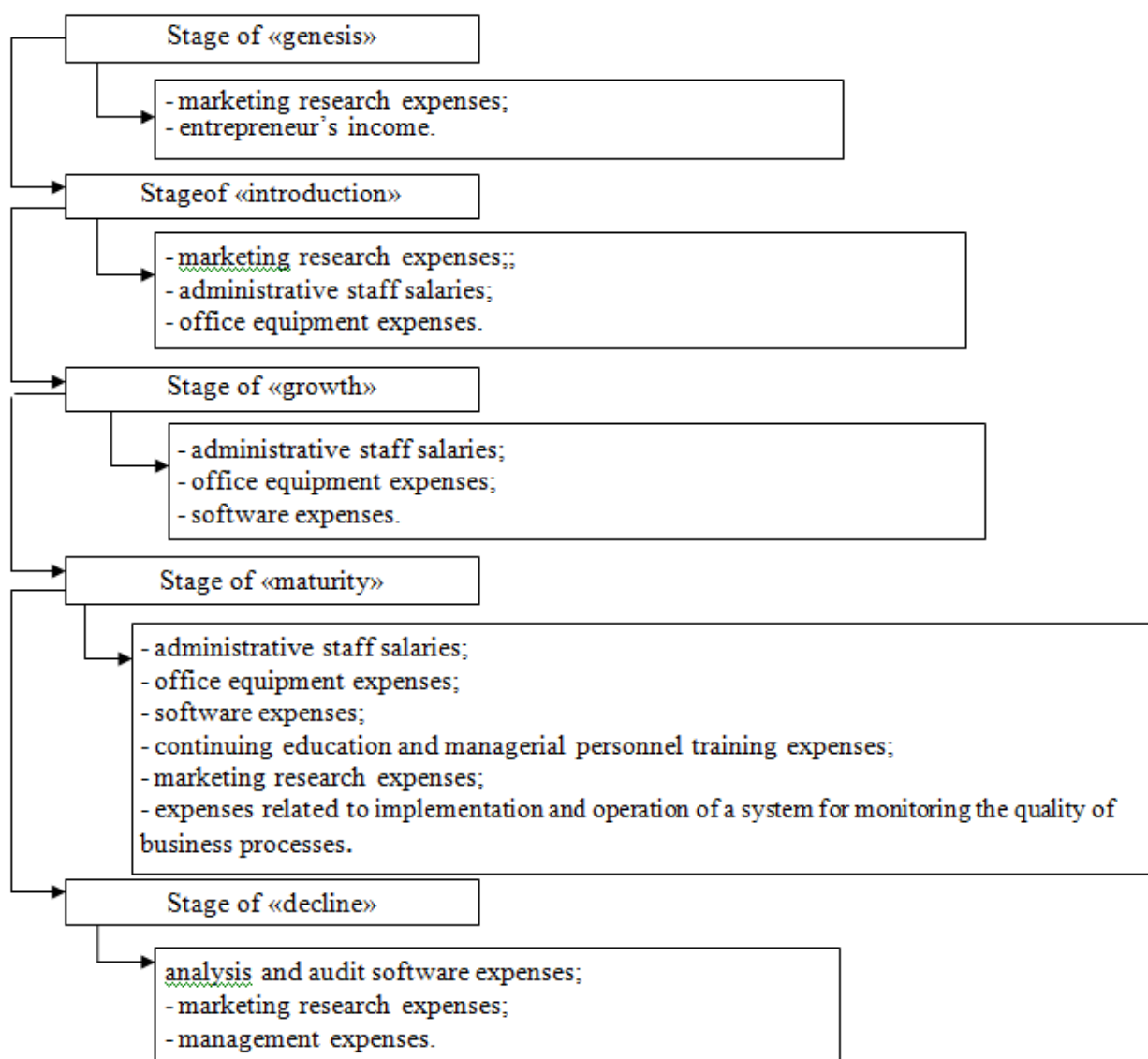
ment decisions. The practical application of the proposed management decision-making algorithm in entrepreneurship provides an opportunity to optimize management functions, since it reduces the number of adjustments and reduces the time for the subsequent implementation of the adjusted actions. The adjusted model of making and realizing management decisions also enables to forecast the efficiency of management actions on the basis of statistical analysis, by having regard to the stage of life cycle of business organization.



**Figure1.** Algorithm Scheme for Making Management Decisions in Business Organization [1]

The analysis of the problem being developed has revealed that the authors traditionally recommend a certain generalized list of evaluation criteria for all enterprise life cycle stages to predict the effectiveness of management decisions made [2]. The study has confirmed the need to use different criteria for assessing the predictive effectiveness of developed and implemented management decisions in the context of the

enterprise “life cycle” stages, whereas a common list of evaluation criteria for all stages of life cycle of the organization is traditionally recommended. We have systematized the list of indicators that characterize the managerial aspect of the progressive development of BO and determine the predictive effectiveness of management decisions adjusted for the specifics of the business organization “life cycle” stage (Fig. 2).



**Figure 2.** Management Indicators of the Development of Enterprise that Determine the Predictive Effectiveness of Management Decisions at the Stages of Its Life Cycle [1]

Based on the above, the expected effectiveness of the implemented management decision in BO (Y), in general, we formalize, as a function of a set of indicators, logically and consistently indicated in figure 2:

$$Y = f (E_{AS}, E_{OE}, 3_{CE}, 3_{QS}, 3_S, 3_{MR}) , \quad (1)$$

where:  $E_{AS}$  –cumulative salary expenses of administrative staff, thousand rubles;

$E_{OE}$  - combined expenses for office equipment, thousand rubles;

$E_{CE}$  - combined expenses for continuing education and managerial personnel training in the business organization, thousand rubles;

$E_{QS}$  - aggregate expenses for implementation and operation of a system monitoring the quality of business processes in business organization, thousand rubles;

$E_S$  - combined expenses for software required for the development and management decision making, thousand rubles;

$E_{MR}$  - cumulative expenses for marketing research for a business entity, thousand rubles. It should be noted that management decisions in the field of marketing research in order to optimize costs should be made on the basis of logistic principles based on the “Make or Buy Problem” approach [3, 4]. The current level of development of the market infrastructure allows economizing financial resources at the expense of the priority of the “Buy” option, since service organizations that provide specific services for enterprises usually compete with each other. This market situation provides an opportunity to choose the most profitable commercial offer. The listed heads of expenditure are considered in relation to a certain period (preferably for a calendar

year) and are independent variables to set up an equation that is used later to estimate the resulting indicator [5-8]. As an dependent variable based on statistical analysis, we recommend to apply the gross profit indicator, or net profit, profitability indicators, as well as turnover. Experience has proven that these indicators most accurately reflect the economic interests of organizers and main beneficiaries of the enterprise [9]. A

correlation-regression analysis of data on the three enterprises of the Republic of Tatarstan (RT), which are at different stages of "life cycle", has been carried out. The results of the analysis have proved the correctness of the choice of indicators shown in Figure 2. The results of the analysis are clearly presented in Table 1 [10].

**Table 1.** The Results of Correlation and Regression Analysis of Enterprises of the RT [1]

| Analysis object                       | The equation   | Indicators, thousands of rubles   |
|---------------------------------------|--|---|
| «Azino Auto»: Stage of «introduction» | $Y = 18681 + 24,34 * X_1 + 0,91 * X_2 + 8,69 * X_3$  | Y – Net Profit;<br>X <sub>1</sub> – Administrative staff salaries;<br>X <sub>2</sub> – Office equipment expenses;<br>X <sub>3</sub> – Marketing research expenses.  |
| «Parquet-plus: Stage of «growth»      | $Y = 13072 + 12,34 * X_1 + 78,7 * X_2 + 2,1 * X_3$   | Y – Net Profit;<br>X <sub>1</sub> – Administrative staff salaries;<br>X <sub>2</sub> – Software expenses;<br>X <sub>3</sub> – Office equipment expenses.  |
| «Skat»: Stage of «maturity»           | $Y = 11013 + 1,11 * X_1 + 0,38 * X_2 + 22,17 * X_3 + 59,36 * X_4 + 20,14 * X_5 + 1,96 * X_6$ | Y – Net Profit;<br>X <sub>1</sub> – Continuing education and managerial personnel training expenses;<br>X <sub>2</sub> – Office equipment expenses;<br>X <sub>3</sub> – Administrative staff salaries;<br>X <sub>4</sub> – Software expenses;<br>X <sub>5</sub> – Expenses related to implementation and operation of a system for monitoring the quality of business processes;<br>X <sub>6</sub> – Marketing research expenses. |

The data from the table show that at the stage of "introduction", the greatest dependence is between the indicators of net profit and the administrative staff salaries and marketing research expenses; the stage of "growth" is marked by a clear relationship between the resulting indicator of implementation of management decisions (net profit) and salaries of managers, as well as software costs. The stage of "maturity" reveals the corresponding dependence of the resulting indicator on the following indicators: software expenses, administrative staff salaries, costs related to the implementation and operation of a management system for monitoring quality of business processes, marketing research expenses, and continuing education and managerial personnel training expenses. At the same time, the least significant dependence is observed in the analysis of the correlation of the resulting indicators and expenses for technical equipment of the enterprise (association). Note that the last of the identified trends is characteristic for all stages of "life cycle" of business organization [11].

#### 4. Conclusion

The results of the analysis of the set of management decisions at different "life cycle" stages of enterprises makes it possible to identify priority factors that significantly affect the performance of a business organization in a competitive market. It has been revealed that in order to achieve high efficiency and effectiveness of the use of the recommended managerial decision-making algorithm, the following factors should be taken into account: "administrative staff salaries" and "management expenses". At the same time, the sum of expenses for "office equipment" is a relatively insignificant factor for the formation of forecast estimates of business efficiency as a result of making optimal management decisions. At the "maturity" stage, which is important for each organization, the least significant dependence of the resulting indicators and expenses on the office technical equipment of business organization is revealed [12].

## 5. Summary

The revealed patterns and the built-up sequence of managerial actions provide the managers of economic entities with the opportunity to take into account the degree of influence of factors forming the features of management at various stages of “life cycle” of business organization. In general, consideration of significant accents in the management at each enterprise “life cycle” stage will ensure sufficient flexibility of the organization’s managed system, reduce the “response time” to external influences and generate an aggregate economic effect in the activities of entrepreneurial structures.

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