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DATA SHAPING FOR IT PRODUCT STRATEGY ANALYSIS USING FUZZY COGNITIVE MODELING

For three aspects of strategic analysis of the implementation of the product strategy of an IT company (financial results, the level of customer focus of the product, sales and marketing efficiency), KPIs have been formed, and the influencing factors are presented in the article. These factors will be used for fuzzy cognitive modeling in the process of strategic analysis of the product strategy.

Strategic analysis tools are used to analyze the activities of an IT company and analyze its product strategies. Strategic analysis tools such as VRIO, PESTEL, HEART Framework, AARRR framework, etc. can be adapted to analyze the product strategies of an IT company [1]. But as a result of such use, a qualitative analysis of the strategy is obtained, which may include contradictory conclusions, fuzzy conclusions. Therefore, strategic analysis tools are most often used together with analytical methods and methods of managerial decision-making. For example, in the paper [1] it is proved the feasibility of implementing SWOT analysis using the analytical hierarchy process (AHP). Fuzzy modeling is an effective tool for improving traditional strategic analysis methods. For example, The Technique for Handling Ordinal and Ratio scales (THOR) is used to analyze complex situations, objects, and systems. For effective use of THOR, it is proposed to use fuzzy logic tools, which improves the quality of decision-making when working with complex situations and systems [2]. In the paper [3], it is proved that cognitive and fuzzy modeling is a powerful tool for strategic analysis of IT company activities. It is proposed to use the tool of fuzzy cognitive modeling for strategic analysis of IT company product strategy.

Therefore, it is necessary to solve the problem of choosing KPIs that show the results of the strategy implementation. Analysis of the values of these KPIs will allow you to make effective decisions to improve strategy in accordance with the goals of the IT company's development, for example, it can be an improvement in financial results, an increase in market share due to an increase in the number of product users, an improvement in the IT product quality, etc. Such KPIs can also be used for strategic analysis of an IT company's activities. [4]. But first of all, indicators should

characterize the results of product sales on the IT market, and not the results of the entire company's activities. [5].

The KPIs that must be used to analyze the implementation of the strategy in three aspects and the factors that affect the value of these KPIs have been formed.

1. The financial aspect of the implementation of the strategy, which is assessed according to the following KPIs:

- Average revenue per user (ARPU) and Monthly Recurring Revenue (MRR); Revenue for a certain period depends on the price and number of licenses sold for a product for a particular user, so it is necessary to assess the impact of the price factor and the number of subscribers on financial results;

- Customer Lifetime Value (CLTV or LTV) depends on the customer's retention period and the revenue they generate during that period;

- Earnings Before Income Tax and Amortization (EBITA) is calculated on a specific product for a certain period.

2. The level of customer focus of the product is assessed by the following KPIs:

- Customer retention rate (CRR) depends on the number of customers «retained» by the product, that is, the number of loyal customers to whom personal communications and loyalty programs were applied (you can consider the effectiveness of these programs);

- Churn Rate (CR) depends on the number of customers who were lost during a certain period, and lost (underreceived) income can also be taken into account;

- Conversion rate (CR) depends on the number of actions of product users that the user wants the user to take (for example, make a purchase, click on an ad, etc.);

- The Net Promoter Score® (NPS)® measures the number of loyal customers who recommend and the customers who are likely to recommend the product (promoters) compared to those customers who criticize it;

- Earned growth rate (EGR) depends on the number of customers who are involved in the product thanks to word of mouth;

- Customer Satisfaction Score (CSAT);

- Customer Effort Score (CES) depends on the level of ease users can perform certain actions when working with the product.

3. Sales and marketing team effectiveness:

- Daily Active Users (DAU) and Monthly Active Users (MAU);

- Contract Profitability (CP);

- Average Revenue Per Account (ARPA) depends on the total revenue generated from the sale of the product for a certain period and the number of users (customers of the IT company) who generated this income;

- Win Rate (WR) depends on successful contracts in a given period and all possible trades that were considered in that period;
- Average Deal Value (ADV);
- Inbound Qualified Lead Velocity (IQLV) depends on the number of identified potential leads in the future and existing for a certain period in certain market segments;
- Customer Acquisition Cost (CAC).

Factors influencing the formed KPIs are determined. As a result of the analysis of these factors, it was found that there is a group of factors that affect some KPIs in different ways.

It is proposed to first consider pairs of factors to simplify the analysis. Based on the selected factors, the main tasks that need to be solved to identify the relationship between pairs of factors and include them in the list of main factors influencing the effectiveness of the product strategy are formed.

1. Price and number of licenses sold: the task of establishing the degree of elasticity of their dependence on each type of client of an IT company.

2. Customer retention costs and the number of loyal customers: the task of identifying the correlation between these factors and the impact on the number of added customers due to the recommendations of loyal customers.

3. The number of desired user actions and the number of product improvements (or product improvement costs): the task of identifying the impact of each additional product feature affects the dynamics of the number of desired user actions.

4. Customer satisfaction and product improvement costs: the problem of estimating the elasticity of satisfaction from additional investment in the product.

5. Number of active users and costs of marketing activities: identifying the correlation between these factors.

6. Number of successful contracts and costs for selling a product: tasks for evaluating the current effectiveness of the sales team. Current performance shows results for a certain period, it is not taken into account that the efforts of the sales team can produce results in the future, so it is advisable to analyze such factors for several periods.

7. Customer retention period and customer revenue: the task of identifying the impact of the revenue received from a customer on the duration of its retention period.

Such tasks can be solved separately to make short-term decisions to improve certain KPIs. It is proposed to systematically consider the solution of these problems

within the framework of cognitive analysis to identify the influence of factors on the effectiveness of the strategy. Since some factors are measured in qualitative dimensions, for example, customer satisfaction, it is proposed to construct a fuzzy cognitive map to model the impact of changes in certain factors on the KPI value and assess the effectiveness of the product strategy.

Conclusion. Thus, the formed system of factors will be used to conduct fuzzy cognitive modeling, as a result of which significant factors influencing the effectiveness and risks of strategy implementation will be determined. And this is the basis for decision-making to improve the product strategy in accordance with the strategic goals of the company.

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