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OPTIMAL CHOICE OF ENTREPRENEURIAL MEASURES

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Sooner or later, every company begins to realize that the list of goods and / or services it provides is not enough to maintain a sustainable development regime. In some cases, such measures are planned due to the pre-bankruptcy state of the enterprise.

In this case, planners determine a list of possible areas of enterprise development. Such a list may contain several measures, but in most cases their number does not exceed the options.

The following is a typical algorithm for determining the optimal distribution of borrowed funds for the entire list of proposed measures[1].

First step. Creating a questionnaire to interview experts who should comment on the future effectiveness of each of the proposed measures for enterprise development. Scores are set according to a predetermined possible range of values, for example: 1 - the lowest efficiency, 10 - the highest efficiency.

The results of the survey are summarized in the table of the following type, presented in Table. 1.

Table 1
A typical structure for presenting the opinions of experts

Experts	Evaluations of the proposed development options			
	Version 1	Version 2	...	Version N
Expert 1	Evaluation	Evaluation	...	Evaluation
Expert 2	Evaluation	Evaluation	...	Evaluation
...
Expert M	Evaluation	Evaluation	...	evaluation

At the end of the survey, the results need to be processed to determine the level of unanimity of experts, for example, to calculate the Kendell concordance coefficient. For the entire sample of expert assessments, it must be at least 0.65 [2].

If so, for each development option it is necessary to find an average assessment of its effectiveness.

The second step. It is necessary to determine the initial costs of all types of activities and calculate the total amount that the company can attract for its own business.

The third step is to forecast, according to experts, the volume of possible orders for each development option. The data are again collected in a table such as table. 1.

In this case, the experts must no longer indicate the points, but the absolute numbers of possible orders. Therefore, before determining the level of unanimity, all expert assessments should be ranked in ascending order for each event, assigning a rank number 1 for the number with the lowest value, and assigning an M number for the number with the highest value, where M is the number of experts.

If the level of unanimity of experts in this case is acceptable, the projected number is averaged over each factor. These will not allow you to find the projected revenue from each event.

The fourth step. Optimization of amounts to be spent on all proposed measures. For this stage it is necessary to solve the optimization problem of the form
Target function:

$$\sum_{i=1}^N (I_i - L_i) R_i X_i \rightarrow MAX, \quad (1)$$

With restrictions:

$$\begin{aligned} \sum_{i=1}^N X_i &\leq ZI + Cr, \\ X_i &\geq 0. \end{aligned} \quad (2)$$

Where

R_i – rating of new directions;

X_i – the amount that will be directed to the development of the i-th direction;

I_i – Income that can be obtained from the i-th event;

L_i – needs for implementation of the i-th measure;

Cr – credit;

ZI – investor involvement;

N – the number of proposed measures;

$$1 \leq i \leq N.$$

An example of application of the proposed algorithm is given

Example one.

The following list of future development was chosen for PROM DEN INVEST LLC, the main activity of which is the provision of transport services by trucks:

1. Maintenance and repair of vehicles
2. Provision of transportation services
3. Excursion and tourist transportations
4. Long-distance transportation services by regular buses
5. Resumption of agricultural activity.

The expert survey was conducted until the experts' assessments were agreed on the Kendall concordance coefficient. The calculations were performed using the Statistica program. The value of the concordance coefficient W was obtained equal to 0.72, ie the experts' estimates are agreed. These data were taken as input data to build an economic-mathematical model.

The second step is to determine the initial costs of all types of business and determine the total amount that the company can attract:

1. Maintenance and repair of vehicles - 133840.5 hryvnias.
2. Provision of transportation services - 299,500 hryvnias.
3. Excursion and tourist transportations - 287980 hryvnias.
4. Long-distance transportation services by regular buses - 158,800 hryvnias.
5. Resumption of agricultural activity - 305740 hryvnias.

The third step is to forecast, according to experts, the volume of possible orders. For each type of proposed activity, the concordance coefficient was first determined, and then the one with the highest possible volume of ambassador values was selected.

1. Maintenance and repair of vehicles, $W = 0.66$, 70-80 vehicles per month.
2. Provision of transportation of things (moving), $W = 0.75$, 20000-30000 km.
3. Excursion and tourist transportations, $W = 0.88$, - 12-18 excursions.
4. Long-distance transportation services by regular buses, $W = 0.92$, 120-140 transportation per month.
5. Resumption of agricultural activity, $W = 0.86$, 70000-80000 tons per season;

The fourth step - finding the optimal distribution of measures - was performed using the Solver function of Excel spreadsheets.

As a result of calculations, it turned out that the optimization task proposes to direct all funds raised to the event "Restoration of agricultural activities", as it will provide the greatest profit.

The second example.

The following list of future developments was chosen for PJSC UkrSotsbank in order to prevent pre-bankruptcy:

1. Development of the collector service
2. Sale of bank property
3. Reduction of staff
4. Electronic banking
5. Cryptocurrency accounts for customers
6. Offshore accounts for clients.

All these measures were identified by experts as effective with a concordance coefficient of $W = 0.68$.

The calculation of future needs and revenues from the application of the proposed measures gave the following results:

1. Collectors income 12 065,622 thousand UAH, needs 452,460 thousand UAH
2. Sale of property income from the second event income 42 180 thousand UAH, Needs 0 thousand UAH.
3. Reduction of staff So income 8 700 thousand UAH, needs 0 thousand UAH.
4. The following types of possible activities have been combined into one group, as they are not typical for this bank.

Therefore, to obtain data on the projected income from the implementation of innovations, we use customer surveys. 1,000 customers took part in the online survey. We asked what innovation interested them the most and what they were most willing to pay for. The results are shown in table 2

Table 2
Customer survey on new types of services

Innovation	Number of customers	The average amount that 1 client is willing to pay	Projected income
Electronic banking	845	15 000	12 675 000
Blockchain	378	20 000	7 560 000
Cryptocurrency accounts for customers	403	80 000	32 240 000
Offshore accounts for clients.	209	300 000	62 700 000
Total:			115 175 000

As can be seen from Table 2., customers respond positively to the introduction of innovations and are willing to pay for new types of services.

Therefore, the projected income from the introduction of innovations is 115 175 thousand UAH

The needs for the beginning of the implementation of this measure amount to UAH 1,130,000

The fourth step of calculations according to the proposed model was also performed using the Solver function of Excel spreadsheets.

Optimization took place regarding the distribution of capital between several areas of investment, to obtain maximum profit. At the same time, a value of UAH 242,180,000 was obtained, an amount that can be raised due to the measures taken.

So, for two companies that have an incompatible type of activity. It was proved that the proposed algorithm is effective and can be applied in any field of activity.

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