

INTEGRATED APPROACH TO STRATEGIC PLANNING IN PUBLIC INSTITUTIONS

Juozas Bivainis, Živilė Tunčikienė

*Department of Social Economics and Management, Vilnius Gediminas Technical University,
Saulėtekio al. 11, 10223 Vilnius, Lithuania, e-mail: vvfsevk@vv.vgtu.lt*

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Abstract. Planning of actions for implementation of institution's strategic decisions is one of the most complicated, on the other hand, the weakest in methodic provision complex objectives of strategic planning. Considering the local target of this phase of the strategic planning cycle to set the best ways to take the right directions in development of the scope of activity of an institution, a well-reasoned composition of such a complex objective is as follows: generating action plan alternatives, defining the evaluation criteria of the alternatives and forming a combination of criteria, analysis and evaluation of the action plan alternatives, adopting a plan. The structure of an action plan for implementing institution's strategic decisions arose the necessity to identify two-level objectives for drawing up the plan as well as the specific sequence of objective fulfilment in an analysed complex. The specifics of each level was evaluated in our proposals for improvement of the planning of the implementation of institution's strategic decisions based on the analysis of the results of progressive experience.

Keywords: public institution, action plan, methods, multicriteria evaluation.

1. Introduction

Improvement of strategic planning's methodic, informational and organizational provision, practical application of theoretical potentiality have become a frequent object of scientific research, often a topic of scientific discussions.

For the last few years such problems of strategic planning in public institutions have also been on the agenda of our scientific research. In earlier stages of this research we justified the expedience of applying a combination of prescriptive and emergent strategic planning approaches [1], we described the cycle of strategic planning in a public institution, defined a well-balanced composition of its objectives [2]. On the level of integrated objectives it is composed of the following: strategic analysis of the institution, defining target orientation, preparing and making strategic decisions, working out an action plan for implementing strategic decisions, monitoring the implementation of an action plan.

It was offered to use sets of methods for fulfilling basic objectives [3]. Simultaneously it was diagnosed which

is the weakest segment of methodic provision for institution's strategic planning – a set of objectives for planning the implementation of strategic decisions. Improvement of its methodic provision was the goal of the stage of the research the results of which are presented in this paper.

Methods of systematic analysis, logic and synthesis were used in this research.

2. The problem structure

Planning of actions for implementation of institution's strategic decisions is one of the most complicated complex objectives of strategic planning. Our research shows [1; 2] that considering the local target of this phase of the strategic planning cycle to set the best ways to take the right directions in development of the scope of institution's operations, a well-reasoned composition of such a complex objective is as follows:

- generating action plan alternatives,
- defining the evaluation criteria of the alternatives and forming a combination of criteria,

- analysis and evaluation of the action plan alternatives,
- adopting a plan.

To accomplish such an objective it is often suggested to use the methods based on principles that are applied in accomplishing other objectives of strategic planning [4–7]. However, it must be stated that current methodic provision does not answer today’s practical needs. There are not enough methods that would enable to properly accomplish the set of objectives composed of objectives proved by our research [2; 3].

When we were still trying to reason the methodological approaches we specified the basic component of the research object – the action plan for implementation of strategic decisions. The method of Work Breakdown Structures (WBS) [7; 8], was applied to achieve that. Structural elements of an action plan (AP) defined by this method are: goals of the plan (PG), tasks implemented (PT), activities of implementing the tasks (PA) (Fig 1).

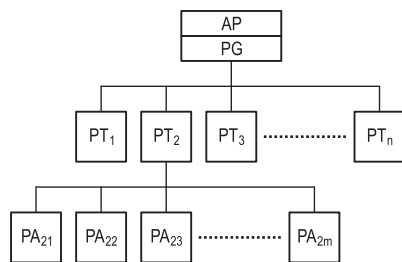


Fig 1. Structural elements of an action plan

Such a structure of an action plan arises the need to define two-level (action plan tasks and activities to achieve the tasks) planning objectives as well as the specific sequence of achieving the objectives of the analysed set: generating alternatives, defining the evaluation criteria of alternatives as well as forming a combination of criteria – from a more general (task) to a more specific (activity), analysis and evaluation of alternatives, choosing the best alternative – from a more specific (activity) to a more general (task). This logic is explained as follows:

- 1) generating of alternatives at the level of activities is based on the analysis of the elements of the content of the task as well as the factors affecting the content, whereas defining the evaluation criteria of alternatives and forming a combination of criteria at the level of activities is based on converting the goals of the task into a system of criteria;
- 2) analysis of alternatives and their evaluation at the level of activities is an analysis of the influence of

alternatives to achieve the goals of the task and the input necessary to influence that, whereas choosing the best alternative at the level of activities is defining the alternative that has more advantages than other alternatives.

3. Proposed methods of accomplishing the set of objectives

Generating action plan alternatives means foreseeing the possible actions of the most effective distribution of institution’s resources, their most rational use and the most purposeful development, analysis of correlation of actions, defining variations of consolidating different actions into a single entity. Goals of the action plan can be achieved by applying different combinations of tasks (a, b, c) and every task – by different combinations of activities (d, e, f) (Fig 2).

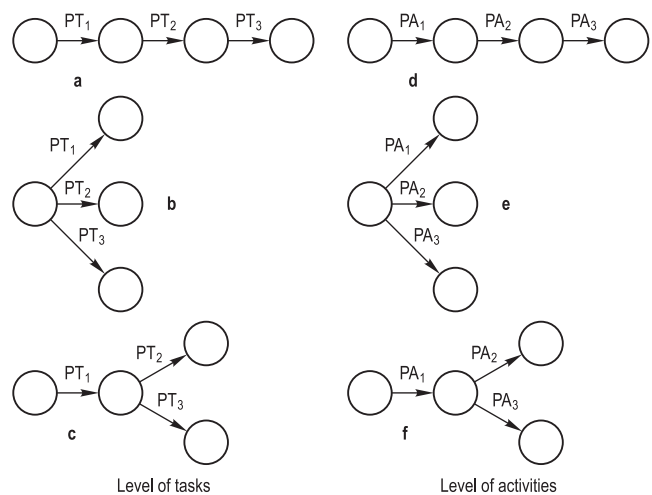


Fig 2. Achieving the goals by applying different combinations of elements of an action plan

Such general methods of generating alternatives as existing solutions, benchmarking, innovative solutions, methods of matching and conversion can be applied to generate variations of combinations of tasks for achieving the goals of an action plan as well as variations of combinations of activities to achieve the tasks [3; 9]. The PERT method is also applied to achieve the objective [8; 10]. The expression of a combination of the PERT method and creative thinking as well as methods of encouraging such thinking used for this purpose are different variations of technological network model (TNM) reflecting the sequence of actions for implementing decisions as well as their interrelation [11]. Within the analysed context, the main elements of TNM are (Fig 3):

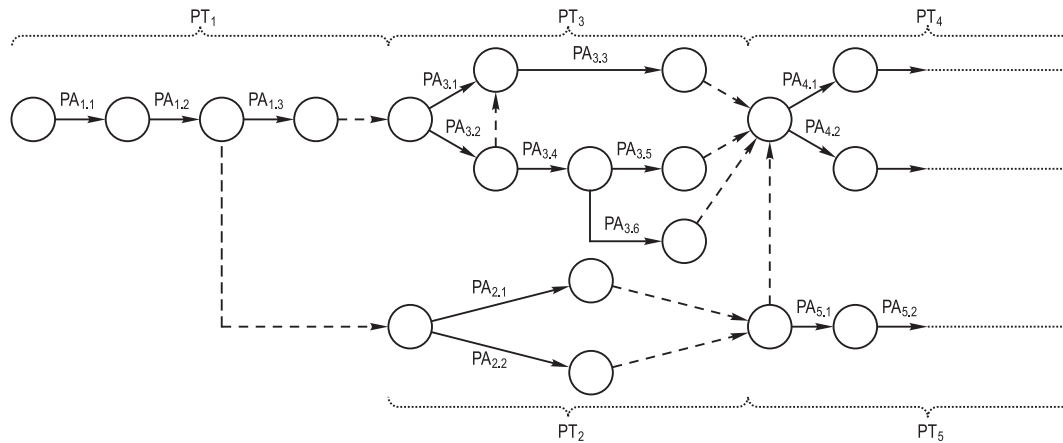


Fig 3. Fragment of TNM of possible actions to implement strategic decisions

- 1) activity, equal to the element „work“ (marked by a continuous arrow),
- 2) assumed activity – or a logical dependency relating to the activities (marked by a dotted arrow),
- 3) event that ends the implementation of an activity or activities equal to the element „knot“ (marked as a circle),
- 4) task equal to a fragment of a network,
- 5) relation between the activities (work) and tasks (fragments of a network), based on strict technological and organizational dependency.

A rational possibility to define the criteria for evaluating the action plan alternatives and forming a criteria combination is to adapt the combination of methods offered for fulfilling an analogous objective of strategic alternatives based on converting the goals set into a system of criteria for evaluating alternatives [3]. To do that it is necessary to revise the selection of primary criteria for evaluating alternatives of an action plan following the general principles of defining criteria [5]. In this case it is reasoned to choose indicators, the application of which allows the analysis of the main factors influencing the implementation of the goals set. Due to diversity of factors influencing implementation of the goals it is necessary to have a wide range of alternative's evaluation criteria.

In consideration of the requirements imposed on the criteria, to evaluate the alternatives of combinations of the action plan tasks and the activities to achieve the tasks we suggest to apply the indicators of quantitative and qualitative expression as primary criteria that give a comprehensive characterization of the influence of different factors on the alternatives in terms of aiming, efficiency and fitness. The primary criteria for aiming can be indicators, the application of which enables to make an analysis and evaluation of the conformance of the goals set, the relation of the potential of sup-

porters and opponents (matching of the interests of the groups of influence), possibilities of alternatives for implementing the goals set (matching of the potential of the resources). The result of the implementation of alternatives as well as the input necessary to achieve such results are the primary criteria for the efficiency of structural elements of an action plan, the application of which is a prerequisite for analysing the main factors influencing presumable benefit of implementing alternatives. Primary criteria for defining the fitness of alternatives can be the indicators, the application of which enables to analyse and evaluate the clarity of the elements of the combination (clarify any cases of recurrence of the purpose of the elements of the combination) as well as the quality of the interrelation of the elements of the combination, also, the uniformity of forming the base of the combination.

When adapting the method applied in achieving an analogous objective of strategic alternatives to form the combination of evaluation criteria of an action plan alternatives, no changes in technological procedures are necessary. Primary qualitative and quantitative criteria are combined into partially integrated ones in accordance with their intercomparability and the similarity of the content. Application of partially integrated criteria enables to make evaluation of the aiming, efficiency and fitness of each alternative. In turn, partially integrated criteria are combined into a single complex of integrated criteria, the application of which enables to analyse the alternatives of combinations of tasks as well as combinations of activities for their implementation by synthesizing the factors affecting the aiming, efficiency and fitness in accordance with the importance of such factors for the implementation of the goals set.

The expression of the combination of methods adapted for the performance of the discussed objective is a system of criteria for evaluating alternatives of an action

plan consisting of three-level criteria sub-systems that give a comprehensive description of the impact of different level factors on the aiming, efficiency and fitness of the alternatives of combinations of tasks as well as combinations of activities for their implementation.

Two methods should preferably be applied in *analysing and evaluating action plan alternatives*: method of „cutting“ technological network model fragments (TNM) [11] and multicriteria evaluation method [12; 13]. The essence of „cutting“ technological network model fragments is the „cutting“ of fragments from TNM of potential actions of implementing strategic decisions, identifying comparative variants of the „cut“ fragments, thorough analysis of the variants (Fig 4).

In order to adapt a typical method of „cutting“ TNM components for this purpose, it should be supplemented with the procedure of analysing the causes of irrational variants, the results of which enable to reveal the inner resources of the institution and can be used to analyse and develop more promising variants.

Such methods as the Expert Judgment, Gambling Theory, TOPSIS, VICOR, SNOD, COPRAS and other methods have already been applied for multicriteria evaluation of alternatives. The most promising of them is TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) based on the synthesis of partially integrated evaluation criteria [12–14].

In order to prepare a database for multicriteria evaluation of action plan alternatives by using TOPSIS it is necessary to analyse the aiming, efficiency and fitness of the alternatives. In accordance with these evaluations, the values of partially integrated criteria are assessed. Multicriteria evaluation of action plan alternatives by using TOPSIS is based on the synthesis of these values.

Different methods can be used to evaluate the aiming, efficiency and fitness of action plan alternatives by applying each primary criterion: in case of quantitative criteria – the normative, assessment and analogy methods, whereas in case of qualitative criteria – the methods of expert judgment, the organoleptic, recommendational, sociological and assessment methods [11].

Empiric research [15] shows that the best methods for evaluating the aiming, efficiency and fitness of action plan alternatives by applying each primary criterion are the methods of expert judgment. In order to guarantee comparability and to simplify calculations it is reasonable to apply a general evaluation scale. Alternatives can be analysed and evaluated according to primary qualitative criteria within the interval [0, 1]. Within this interval the best evaluation value is 1 and the worst – 0 value. Each alternative gets its evaluation value of the interval [0, 1] based on the principles of logic.

It is advisable to define the weights of primary evaluation criteria in each group of criteria separately. A popular method used to define the weights of evaluation criteria is intercomparison of all criteria and grading them according to the received ratio values. It should be stressed that the relative weights of the evaluation criteria (q_i) should meet the usual conditions:

$$(0 \leq q_i \leq 1, \sum_{i=1}^m q_i = 1, i = 1, 2, \dots, m).$$

Assessment of the aiming and fitness of alternatives according to each partially integrated criterion means conversion of expert judgment into a more general system by using elementary algorithms that define the ratio of the primary criterion value determined by experts and the value of the criterion in a more general system [15].

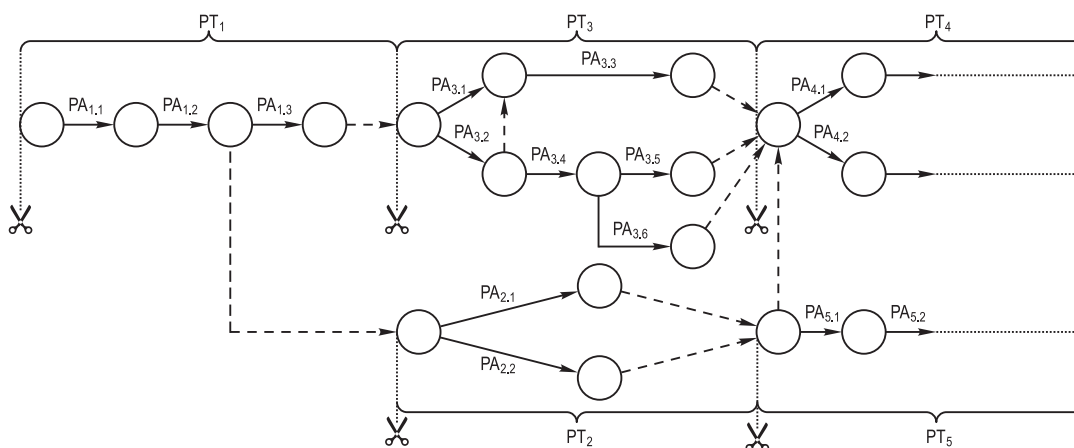


Fig 4. „Cutting“ fragments from TNM of potential actions to implement strategic decisions

To evaluate the efficiency of action plan alternatives we suggest using a set of methods based on implementation of alternatives according to a calendar plan. Within the analysed context the objective to make a calendar plan means to define the possible actions for distribution, use and development of institution's resources within a time scale, work out the demand for resources and possibilities of satisfying the demand as well as to determine and use the reserves for increasing possibilities to satisfy the demand in order to achieve the goals set [16; 17]. The results of fulfilling the objective enable to evaluate alternatives according to partial criteria of efficiency. Among such universal criteria one may mention such criteria as single costs, usefulness of costs and value of costs [15].

In order to evaluate action plan alternatives by using the TOPSIS it is advisable to provide the values of primary criteria for aiming, efficiency and fitness of action plan alternatives, the weights of such criteria as well as other quantitative information (indications of maximizing and minimizing criteria) in a decision evaluation matrix [18].

In order to achieve comparability of the assessed evaluation criteria expressed in different activities it is necessary to convert them into a non – dimensional form which is possible to be compared. The following normalization of the values of evaluation criteria (v_{ij}) is intended if TOPSIS [11–14] is used:

$$v_{ij}^* = \frac{v_{ij}}{\sqrt{\sum_{j=1}^n v_{ij}^2}}, i = 1, 2, \dots, m, j = 1, 2, \dots, n, \quad (1)$$

where v_{ij}^* – a normalized element of decision evaluation matrix.

A balanced normalized decision evaluation matrix is done by multiplying the normalized matrix by the vector of criteria weight, i.e. each element of the matrix is multiplied by a relevant criterion's weight (q_i):

$$\tilde{v}_{ij} = q_i \cdot v_{ij}^*, i = 1, 2, \dots, m, j = 1, 2, \dots, n, \quad (2)$$

where \tilde{v}_{ij} – an element of a balanced normalized decision matrix.

The ideal positive (A^+) and the ideal negative (A^-) variants are defined by applying the formulas:

$$A^+ = \left\{ \left(\max_j \tilde{v}_{ij} \mid i \in I \right), \left(\min_j \tilde{v}_{ij} \mid i \in I' \right), j = 1, 2, \dots, n \right\} = \{ \tilde{v}_1^+, \tilde{v}_2^+, \dots, \tilde{v}_n^+ \}, \quad (3)$$

$$A^- = \left\{ \left(\min_j \tilde{v}_{ij} \mid i \in I \right), \left(\max_j \tilde{v}_{ij} \mid i \in I' \right), j = 1, 2, \dots, n \right\} =$$

$$\{ \tilde{v}_1^-, \tilde{v}_2^-, \dots, \tilde{v}_n^- \}, \quad (4)$$

where $I = \{i = 1, 2, \dots, m\}$ – the set of maximizing criteria, $I' = \{i = 1, 2, \dots, m\}$ – the set of minimizing criteria.

It is necessary to define the proximity of each alternative to the ideal variant (a_j^+):

$$a_j^+ = \sqrt{\sum_{i=1}^m (\tilde{v}_{ij} - \tilde{v}_i^+)^2}, j = 1, 2, \dots, n \quad (5)$$

and to the negative ideal variant (a_j^-):

$$a_j^- = \sqrt{\sum_{i=1}^m (\tilde{v}_{ij} - \tilde{v}_i^-)^2}, j = 1, 2, \dots, n. \quad (6)$$

With their help it is possible to calculate the relative proximity of each alternative to the ideal variant (\bar{a}_j^+):

$$\bar{a}_j^+ = \frac{a_j^-}{a_j^+ + a_j^-}, j = 1, 2, \dots, n, \quad (7)$$

where $0 \leq \bar{a}_j^+ \leq 1$. The best evaluation is the one closest to 1, the worst – 0.

Multicriteria complex evaluation method (known in special literature as COPRAS) [12], can be applied in complex analysis and evaluation of the strong and weak points of the action plan alternatives. It also helps to define the expedience of the alternatives. Within the analysed context, the expedience of action plan alternatives is defined by first calculating the sum of the maximizing and minimizing normalized rates describing the alternatives (V_j^+, V_j^-):

$$V_j^+ = \sum_{i=1}^m \tilde{v}_{ij}^+, i = 1, 2, \dots, m, j = 1, 2, \dots, n, \quad (8)$$

$$V_j^- = \sum_{i=1}^m \tilde{v}_{ij}^-, i = 1, 2, \dots, m, j = 1, 2, \dots, n. \quad (9)$$

In order to define the relative weights of alternatives, it is important to bear in mind the strong and the weak points of the action plan alternatives. The relative weight (q_j) of each alternative is calculated as follows:

$$q_j = V_j^+ + \frac{V_{\min}^- \cdot \sum_{j=1}^n V_j^-}{V_j^- \cdot \sum_{j=1}^n \frac{V_{\min}^-}{V_j^-}}. \quad (10)$$

According to the evaluation of the relative weights of the action plan alternatives it is possible to define the priority of each alternative (the bigger q_j , the bigger the priority) and its expediency (n_j):

$$n_j = \frac{q_j}{q_{\max}} \cdot 100 \% \quad (11)$$

Depending on the topicality, rating systems can be applied to define the priorities of alternatives [19]. In this case the criteria should be indicators, the application of which enables to answer the following questions: how many goals and their priorities the chosen alternative helps to implement, how many receivers among their main interests groups shall benefit from implementing the chosen alternative, what is the influence of the chosen alternative on neutralizing or diminishing the main problems of an institution, whether the chosen alternative has a positive impact on other priorities planned to be implemented, what is the possible support to the implementation of the chosen alternative, etc. In order to define the priorities of alternatives according to such criteria, it is best to apply the expert judgment methods, and in order to calculate the complex criteria values – elementary algorithms defining the ratio of the value of the criterion determined by experts and the value of criterion in a general system.

We suggest to add defining of the probability of achieving results in implementing alternatives to the analysis and evaluation of action plan alternatives. In order to do that the network model of choosing alternatives (ACNM) should be used in this case [20].

Application of ACNM is a reason to choose the best alternative to achieve the goals set according to multicriteria evaluation, bearing in mind the results of the synthesis of the possibilities of the link between the environmental and the inner factors of an institution.

The probabilities can be defined by applying different methods: forecasting calculations, Expert Judgment, some methods of Decision Making Theory. We suggest using the expert judgment methods in the analysed situation. Within the context analysed the main elements of ACNM are as follows (Fig 5):

- 1) the event of choosing the alternative from a combination of activities (task) (marked by a circle and a minuscule letter with an index),
- 2) alternative of harmonizing the combination of activities (marked by continuous arrows),
- 3) the probability of choice of alternatives from the combination of activities (task) (p_{taa}),
- 4) the probability of choosing an action plan alternative (marked by $P(A)$).

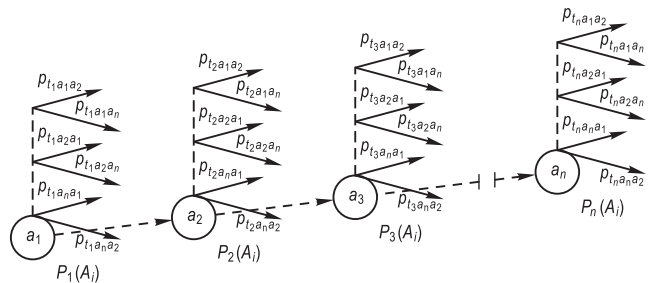


Fig 5. Fragment of network model of choosing alternatives

Ranging methods can be applied to grade the action plan alternatives according to the multicriteria evaluation. In this case the evaluation of alternatives according to the proximity to the ideal point, expedience and other discussed criteria are used to define the range of each alternative. Simple expert judgment is enough to achieve that.

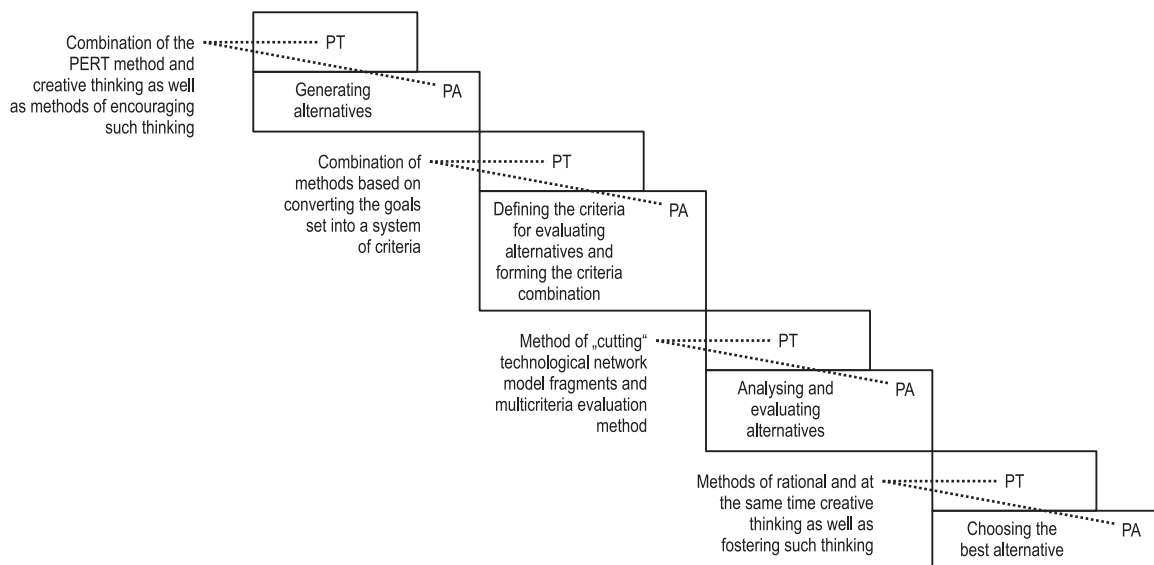


Fig 6. Scheme of working out an action plan for implementing strategic decisions

The best methods to decide which action plan alternatives are right are the methods of rational and at the same time creative thinking as well as fostering such thinking [3]. The expedience of such a set of methods for this purpose is based on *choosing the best alternative* bearing in mind the objective and subjective factors influencing the adoption of an action plan. Application of the methods of rational analysis as well as that of non-formalized thinking is a premise for decision makers to base the solution of an objective by intercomparison and interpretation of the results of multicriteria evaluation of alternatives.

So, suggested set of methods gives a premise to make preparation for the rational action plan – generating action plan alternatives, defining the criteria for evaluating action plan alternatives and forming a combination of criteria, analysing and evaluating alternatives of an action plan, choosing the best alternative (Fig 6).

4. Conclusions

Our proposals for improving the planning of the implementation of strategic decisions in public institutions are based on application of wide-ranging approaches. Their specifics is revealed through levels of action plan tasks and activities to achieve the tasks. Empiric research of the application of the suggested methods enables to state that they have the following capabilities:

1. Generating action plan alternatives in accordance with the actions to increase the possibilities of distribution, application and development of institution's resources, analysing the interrelation of the actions, defining the variants of merging the actions into a whole.
2. Defining the criteria for evaluating the action plan alternatives and forming a combination of criteria, in this way forming the system of evaluation criteria combining the subsystems of three-level criteria that give a comprehensive description of the impact of the factors of different level on the alternatives in terms of aiming, efficiency and fitness.
3. Analysing alternatives of an action plan and performing a multicriteria evaluation of alternatives.
4. Thorough analysing and evaluation of the results of multicriteria evaluation of the action plan alternatives and, according to the results received, choosing the best alternative to achieve the goals set.

Implementation of prepared recommendations gives a premise to make complex solutions to the objectives of the whole strategic planning cycle by this substantially improving the strategic planning of the public institutions.

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