

**BELARUSIAN STATE UNIVERSITY INFORMATICS AND
RADIOELECTRONICS**

Faculty of Engineering Economics

Economy Department

Efficiency of scientific project

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Introduction

In a manual the design procedure of cost efficiency of graduation projects is written by students of all specialties.

Radio engineering devices and equipment, software, scientific researchers can be objects of designing in graduation projects. The new equipment should be technically modern, and economically effective. Hence it is necessary to carry out an economic case of degree projects. After calculation of cost efficiency of the project the solution by efficiency of the graduation project is made.

The economic case content depends on a theme and the design assignment. In an economic case the theme urgency is described, the purposes, the primary goals and features of carried out research are stated, possible use of the received results is described. On the basis of it efficiency of the graduation project is proved.

Cost efficiency calculation consists of following parts: 1) the description of the developed project; 2) calculation of the cost value and the device price; 3) conclusions by efficiency of the project and calculation of indicators of the project.

Cost efficiency of the project is determined on the basis of calculation of indicators of profitability, a time of recovery of inputs, economic benefit, also cost efficiency is proved by comparison of indicators of the designed project, a circuit diagram, a software to existing circuit diagrams, devices, software. It is described advantages of the developed project before existing analogues. The conclusion about efficiency of the developed project becomes

In theory of economic efficiency, economists have different definitions concerning effect and efficiency. Effect, as commonly, is a result from some actions, reasons, forces and so on. It is known the following types of effects: scientific, technical, organizational, ecological, defensive, economical, social, and political. Every effect can be characterized by own method of qualitative estimation.

Calculation of the cost value and the price of the designed device

In the given section, costs connected with accomplishment of works on designing settle payments: costs for materials necessary for accomplishment of the project, costs for a salary of workers of the design works occupied with accomplishment, taxes, additional expenditures connected with designing.

The initial data for calculation of costs for the project are: duration of design works in months, quantity of workers which is carried out by the project, the equipment and materials which were used for accomplishment of works on designing.

1. Calculation of cost of materials for project accomplishment

Calculation is performed under the formula:

$$P_M = K_{Tp} \sum_{i=1}^n H_{pi} C_i \quad (1)$$

Where, K_{Tp} - the coefficient considering hauling expenses
($K_{Tp} \approx$ from 1,0 to 1,10) for the project we accept $K_{Tp}=1$;
 H_{pi} - norm of the expense a material kind on the project;
 C_i - unit selling price a material kind, ruble.;
 n - Quantity of applied kinds of materials.

Calculation to produce in the table.

Table 1- Calculation of costs for the materials necessary for accomplishment of the project

№	The name of materials	Unit of measure	The price, ruble	Quantity	The sum, ruble.
1	2	3	4	5	6
2					
The sum of expenses		-	-	-	

2. Calculation of a base salary of the personnel occupied with accomplishment of works under the project.

The size of costs settles payments under the formula:

$$P_{ow} = K_{np} \sum_{i=1}^n T_{ci} \cdot N_i \cdot t_i, \quad (2)$$

Where, T_{Ci} - a wage rate for a day, categories of workers, ruble;

N_i - quantity of workers of a category;

t_i - time of actual work of the worker of a category under the project, day;

K_{np} - coefficient of awards on bonus systems,

($K_{np} \approx$ from 1,10 to 1,40) for the project it is accepted $K_{np}=1,2$.

Calculation to produce in the table.

Table 4 - Calculation of costs under the clause «a personnel base salary pay» under the project

№	The name of categories of workers and posts	Quantity of units, the people	Salary for one month, ruble.	Coefficient of bonus surcharges	Expenditures of labour, months	The sum, ruble.
1	2	3	4	5	6	7
The sum of expenses		-	-	-	-	

3. Calculation of an additional salary of the contractors, including the various payments provided by the labour law, under the formula:

$$P_{nw} = P_{ow} \cdot \frac{H_{nw}}{100}, \quad (3)$$

Where, H_{nw} - the specification of an additional salary,

$H_{nw} \approx$ from 10 to 25 %, for the project it is accepted $H_{nw}=20$ %.

4. Calculation of deductions to social insurance under the formula:

$$P_{oc} = (P_{ow} + P_{nw}) \cdot \frac{H_{oc}}{100} \quad (4)$$

Where, H_{oc} - rate of deductions on social insurance (the tax), the $H_{oc} = 34,6$ %.

5. Calculation of expenses on scientific business trip under the formula:

$$P_{kom} = P_{ow} \cdot \frac{H_{kom}}{100} \quad (5)$$

Where, H_{kom} - the specification on scientific business trip expenses, $H_{kom} \approx$ from 5 to 20 %, for the project we accept $H_{kom}=20$ %.

6. Calculation of common enterprise expenses under the formula:

$$P_{koc} = P_{ow} \cdot \frac{H_{koc}}{100} \quad (6)$$

Where, H_{koc} - the specification of indirect expenses, $H_{koc} \approx$ from 50 to 100 %, for the project it is accepted $H_{koc}=90$ %

7. Calculation of the complete cost value of the project:

$$C_n = P_m + P_{ow} + P_{nw} + P_{oc} + P_{kom} + P_{koc} \quad (7)$$

8. On level of profitability in percentage of the complete cost value the profit settles payments:

$$P_r = C_n \cdot \frac{Y_p}{100} \quad (8)$$

Where, Y_p - profitability level, $Y_p \approx$ from 10 to 30 %, for the project we accept $Y_p=30$ %.

9. Calculation of the price of the project under the formula:

$$B_n = C_n + P_r \quad (9)$$

10. Calculation of the tax to value added (VAT) under the formula:

$$VAT=B_n \cdot \frac{H_{vat}}{100}, \quad (10)$$

Where, H_{vat} - the tax rate on vat(the tax), $H_{vat} = 20 \%$.

11. Calculation of the price of the project taking into account the VAT under the formula:

$$B=B_n + VAT \quad (11)$$

After calculation of costs and price for project development to be resulted conclusions in which advantage of the developed project before similar projects is described, the cores the technical indicators reached as a result of designing are resulted and the possible increase in technical indicators is resulted, revenues of the enterprise and have arrived the enterprises as a result of project introduction to production.