



Software Development Project Efforts and Time Forecasting Based on a Neural Network

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The problems of forecasting labor costs (efforts) and lead time (calendar time) of software development projects remains relevant, despite the large number of researches in this area (López-Martín, 2015), (Madampe, 2017). There are options for solving it, both using various analytical descriptions (formulas) with empirical coefficients, and proposals for using various types of predictive models. Of the analytical solutions to this problem, the most famous is COCOMO II (Boehm, 2002).

The emergence of widespread practice of the successful use of neural networks has made it possible to put and conduct a research of the possibility of their effective use for predicting labor costs and time for software development projects. This approach has already been used by a number of researchers, for example, to predict the success of such projects (Veido et al., 2019).

The hypothesis of this research is the assumption that it is possible to develop a methodology for predicting labor costs and project lead time based on the use of a trained neural network with results no worse than COCOMO II gives, but without the need to expertly determine and calculate the coefficients of model factors leading to the COCOMO II calculation formula.

The developed method is intended for use, as a rule, for immature organizations, small and medium-sized internal projects (5-15 developers, duration 1-4 months, the financial sector and the development of small services). The object of the research is software development processes in an immature organization, and the research domain is the improvement of software development processes for immature organizations (according to the CMMI model).

To solve the problem, in the research performed determines the variables, determines the criteria and metrics for the forecasting model, determines the choice of the method of training the neural network, neural network creation and training, experiments are being conducted, research of the developed forecasting model, analysis and evaluation of the results.

In this research, it is planned to experimentally prove that the result of the developed forecasting methodology will be no worse than the forecast of the labor costs of developing the project implementation time obtained using the COCOMO II model.

To validate the developed forecasting model, it is planned to use expert assessment as well.

As a result of the research, will be obtained a methodology for predicting labor costs and software development time based on neural networks. The novelty of the described research is the ability to automate the tuning of the prediction apparatus (neural network) to the metric basis of a specific project instead of performing expert determination of factor coefficients for forecasting using the COCOMO II model.

References

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