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DESIGNING AND EMPIRICALLY TESTING THE DIGITAL MODEL FOR EVALUATION OF ORGANIZATIONAL DEVELOPMENT FOR EXECUTIVES

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Abstract

There is a need for study on effective organizational development (OD) methodologies that can unify the measures, considering the management context. The purpose of this research – to develop the digital model for evaluation of OD for executives using artificial neural networks. Quantitative estimation of indicators was carried out using Artificial Neural Network (ANN) system's tools for comparative analysis of American and Finnish organizational development methodologies.

The research is representing identified indicators, integrated to the digital OD evaluation model. The set of indicators were digitalized for usage in artificial neural networks. An innovative intersection for the classification of indicators is presented. Research results will provide leaders with a digital model to evaluate OD and contribute to building leadership capacity in any country.

Keywords: evaluation, organizational development, indicators, artificial neural networks

1 Introduction

The level of digitalization in Lithuania is medium and not fast-paced enough compared to the level of the country's economic development. When assessing progress in digitalization, Lithuania's progress compared to the EU average is practically not visible [1].

To increase the productivity of the country, it is proposed to strengthen the development of executive competencies, ensuring investments in R&D activities and usage of digital tools to evaluate the organizational development results for executives. Global Talent Competitiveness Index 2023 shows that the leaders are America – TOP3, and Finland is on TOP6 [2].

Considering the most famous organizational development (OD) methodologies in the world, two countries: America and Finland, were chosen for this research. The main idea is to analyze American and Finnish OD methodologies. For evaluation of organizational development (OD) the research is identifying a set of unique digital indicators. Action Science

methodology based on action learning practices was selected from America, and Finnish methodology based on consensus principle was selected from Scandinavian countries in Europe. These methodologies are presented in comparison form. The issue is a rapidly growing number of new scientific papers and need to be quickly familiar with new knowledge dictate the need of new modern technique. Artificial Neural Networks (ANN) integration into the evaluation process would be an advantage in latter issue.

Methodology *Action Science* is the meta-theory developed by C. Argyris and D. Schön during fifty years of research works in the field of organizational learning and leadership [3] [4]. Argyris worked at the Harvard Business School. The action theory approach is based on norms and behavioural control of interest [5] [6]. When Finland management methodology is based on consensus decision-making, negotiation and discussion [7], [8].

The aim of this paper is to identify the new applicable set of unique digital indicators and design a digital model (using artificial neural networks), for evaluation of OD for executives.

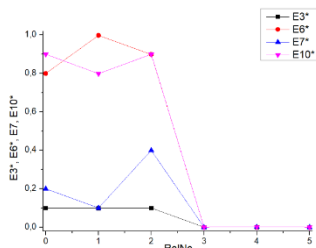
Research Methods

Quantitative estimation of OD methodologies is preparing with Artificial Intelligence (AI) system which can develop quantitative digitalised indicators. 1) The literature review is conducting to identify indicators for evaluation of OD in Action Science (AM) and Finish case (FIN) methodologies. 2) Three major articles were selected, representing the behaviour of AM and FIN. 3) Qualified expert in the OD field can set the cluster of indicators for evaluation of OD. 4) The same expert can estimate the indicators with the biggest influence on OD: to identify sets of words (keywords) extracted from selected publications. 5) ANN is applied in the framework of programme VALLUM01[9] for digitalization of founded indicators. 6) Selected indicators are integrating for training to the programme VALLUM01 (important to test if training process determines the successful predictions of expert). 7) Simulation (validation) process is implementing to check if the simulation gives satisfied performance results.

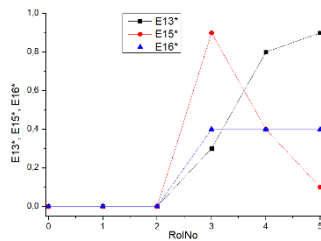
Research results

Artificial Neural Network is requiring the input – output concept for preparation of digital evaluation model. For input indicators specific keywords (cause indicators) from publications were identified in Clarivate Analytics Web of Science and Scopus databases, related to productive leadership and management methodologies, are presented in comparison form, representing semantic behavior. For output indicators expert and quantitative executives survey results helped to construct verified set of digital indicators, as effect cluster of indicators for evaluation of organizational development. Fig. 1 represents distributions of simulated values of indicators that are characteristic for American or Finland methodology. Differences

between established values by expert and values predicted by ANN are negligible (less 0.005).



Simulated values: Facilitation skills for leader, E3; Mature mindset & Productive behaviour, E6*; Effective discussions technique, E7*; Double-loop learning, E10*. Parameters typical for American methodology only, RolNo $\in$ (0, 1, 2)), [Ошибка! Закладка не определена.], [Ошибка! Закладка не определена.], [Ошибка! Закладка не определена.].*



Simulated values: Consensus (negotiations and discussions), E13; Communication, E15*; Transparent behaviour (trust building, openness), E16*. Parameters typical for Finnish methodology only, RolNo $\in$ (3, 4, 5), [Ошибка! Закладка не определена.], [Ошибка! Закладка не определена.], [Ошибка! Закладка не определена.].*

Fig. 1. Distribution of indicators on RolNo of requested publication

Conclusion

A new ANN-based estimation method was developed, designed, and validated. Six peer-reviewed scientific publications were selected for research, representing the highest performance of American or Finnish OD methodologies. Input (keyword values) – output (expert defined metrics) interface was designed. Network convergence was achieved as fully satisfied. Differences between FNN predicted values and expert established values are negligible (less 0.005), when simulation brings very precise result (near to 100%).

Created digital model for evaluation of OD indicators for executives can be applied for critical evaluation of methodologies in different framework. Designed model is necessary for executives of the organizations, business owners and shareholders to evaluate today's organizational development level. This is helping for estimation of actions to improve exact indicator and increase the productivity of the overall organization, as well as management skills of leaders.

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