

Title: Application of artificial intelligence as a knowledge creation instrument in tax procedures

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Abstract : This study set out to find whether deep learning algorithms neural networks and self-organizing maps could be utilized in a value-adding way in the Finnish Tax Administration in the handling of income tax related claims by limited liability companies. According to research positive outcomes in artificial intelligence (AI) utilization have been attained outside Finland. The research was carried out according to the action design research method in which the focus of the research is concurrently building a suitable artifact for the organization and learning (design principles) from the creation and intervention itself. Research began with problem formulation followed by building, intervention, and evaluation. As a result, the project team consisting of three members created two functional artifacts: one based on neural networks, and another based on self-organizing maps. Creation of the artifacts was done in cycles as alpha, beta and gamma where alpha and beta were a neural network and gamma a self-organizing map. Alpha reached a macro average of 0.75–0.78 in classification and beta 0.77–0.79. Gamma gave a different point of view on the problem and was able to clearly identify the class's non-estimated customers in a topographical map. The artifacts were limited to function only as knowledge creation instruments due to legal and ethical limitations present in the context. Results suggest that it is recommendable to approach problems with more than one artifact. The preliminary results of this research were validated by applying the concept in a case organization, followed by an analysis of the results in an end-user setting.

Keywords : Artificial intelligence Machine learning Neural networks Self-organizing maps Tax procedures

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