Project No.	Project Title	
2021-01-255	Improving executive employee recruitment process in organizations using advance machine learning methods and EEG technology	
Academic Advisor		**Co-Advisor**
Dr. Nir Nissim		
Team Members		
Dor Zazon		
zazond@post.bgu.ac.il		

Abstract

The employee recruitment process plays important role in the success of an organization over time. An organization's human resource (HR) department is responsible for the employee recruitment process (including screening, assessment, and selection), and its goal is to select the best, most suitable employees for an organization. Due to the high cost of the recruitment process along with its high rate of uncertainty, HR recruiters utilize a variety of methods to improve its efficiency; thus far, however, NeuroIS methods have not been utilized for this purpose. NeuroIS is a relatively new interdisciplinary field in which neurobiological signals from an examined person are analyzed as a means of enhancing the examiner decision-making processes which until now have mainly been based on traditional information systems (ISs). This study is the first to propose a new NeuroIS-based method aimed at improving the employee recruitment process, and more specifically, the process of recruiting executive employees. Our method has multiple advantages, facilitating the recruitment process, saving costs, and most importantly, allowing an organization to identify and recruit high-quality employees. To evaluate our method, we first measured relevant functional and cognitive abilities of 142 adult participants using computer-based assessment, which included a battery of four executive function (EF) and intelligence tests; this allowed us to measure abilities that are important for executive employee recruitment and abilities whose prediction would benefit the recruiter and the organization. Second, using electroencephalogram (EEG) technology, which is the dominant measurement tool in NeuroIS research, we collected the participants' brain signals by administering a resting state EEG (rsEEG) on each participant. Finally, using advanced machine and deep learning algorithms, we leveraged the collected rsEEG and induced a decision support system capable of predicting participants' executive functions and intelligence levels. Our experiments show encouraging results of up to 72.6% accuracy based on rsEEG, and thus this study lays the groundwork for a novel, generic (non-stimuli based) employee recruitment approach that is less dependent on and biased toward the recruiter's subjective perspective. The proposed method could contribute to the development of new remote recruitment processes, reducing the need for frontal interviews, minimizing costs, and saving time, as well as expanding the pool of candidates to include those living at a distance. Such a remote recruitment process would also be beneficial in the current COVID-19 era which demands social distancing and contribute to the health and safety of all concerned.

Keywords: NeuroIS; employee recruitment; executive function; resting state EEG; machine learning.