Chapter 14

Implementation of an Intelligent Model Based on Machine Learning in the Application of Macro-Ergonomic Methods in a Human Resources Process Based on ISO 12207

Edgar Cossio Franco
Universidad Enrique Díaz de León, Mexico

Jorge Alberto Delgado Cazarez
Universidad de Guadalajara, Mexico

Carlos Alberto Ochoa Ortiz Zezzatti
Universidad Autónoma de Ciudad Juárez, Mexico

ABSTRACT

The objective of this chapter is to implement an intelligent model based on machine learning in the application of macro-ergonomic methods in human resources processes based on the ISO 12207 standard. To achieve the objective, a method of constructing a Java language algorithm is applied to select the best prospect for a given position. Machine learning is done through decision trees and algorithm j48. Among the findings, it is shown that the model is useful in identifying the best profiles for a given position, optimizing the time in the selection process and human resources as well as the reduction of work stress.

INTRODUCTION

Nowadays, the success of many companies is priority. Among the important aspects and factors that impact on the success of companies is the active human. This means that employees should be comfortable in their workplace, this includes have an appropriate work area center for it can be adequately performed; lighting, ventilation, a comfortable chair or similar artifact to sit, the correct distance between the view and the monitor so you do not get tired and have enough tools. In relation with these specific tools, it is important that the worker has access and control of the elements that allow him to carry out their work. If industrial engineers, ergonomists, designers and managers take the elements described previously, they will be focusing about macroergonomics. The goal of this research is centered in the proposal of a specific model that allows to optimize the process of a company dedicated to the hiring of staff, and according to Lear (2011), a good way to reduce the stress in a job is with the automation of the tasks and process to save time. The process by which the companies in this field go through is eventually stressful and should be avoided. As established in (Palferman, 2011), the consequence of not avoiding this workload can be psychological damage. The scenario under which a situation of stress could happen is the following: applications or vacancies that are offered on a normal day may exceed the rate at which they can be evaluated, especially if the number of team members is reduced with respect to the number of candidates for each vacant. In this case, a bottleneck in which the profiles of the company are requested as soon as possible, the company does not have the names for when it is required. In this case, there is work pressure. For the improvement process in the human recourses area, the present work focuses in the ISO 12207 standard in the block of organizational processes. The proposal is applying a model described in two blocks. The first step is capturing the applicants and analyze them, using a tool developed in the Java language that implements an algorithm to making decision under uncertainty. Once the results are obtained, the second step is sending the data to a tool for automatic learning which implement the j48 selection algorithm in WEKA.

The Appendix shows the terminology presented in this work.

Macroergonomics

The goal of macroergonomics is create a pleasant environment in the workplace where intervene social aspects, but also technological (Hendrick, 1991). As established in Montero (2000), the socio-technical systems are characterized by their composition in 4 aspects as shown in Figure 1.

Each aspect shown in Figure 1 represents an axis that must be covered by Macroergonomics in order to guarantee productivity and quality in employees' life (Realyvásquez & Maldonado, 2018). In addition to the socio-technical aspects, Macroergonomics originates from Ergonomics, that is a field where takes care of three aspects: the healthy environment in the workplace, safety and efficiency. Figure 2 shows the areas to derive from Ergonomics.

Machine Learning

Learning is a process through which an agent receives information from their environment, that is processed and applied (Možina, 2018). In the present research, the knowledge that HR people have, although extensive, is insufficient when it is about to evaluating candidate by candidate for a job position; since there is not enough time. This is the reason why machine learning is used to optimize time and resources.

Related Content

Information Systems as Social Systems
N. du Plooy (2003). *Critical Reflections on Information Systems: A Systemic Approach (pp. 105-121).*
www.igi-global.com/chapter/information-systems-social-systems/7268?camid=4v1a

IT Governance
Matthew Guah (2009). *Managing Very Large IT Projects in Businesses and Organizations (pp. 69-83).*
www.igi-global.com/chapter/governance/26044?camid=4v1a

The Valuation of Knowledge in Public-Private Partnerships
J. W. Vasbinder and Th. P. Groen (2001). *Knowledge Management and Business Model Innovation (pp. 250-266).*
www.igi-global.com/chapter/valuation-knowledge-public-private-partnerships/24941?camid=4v1a

Cognitive Processes in Fashion Design: Designing of Modelling Projects for the Visually Handicapped
Geraldo Coelho Lima Júnior (2018). *Fashion and Textiles: Breakthroughs in Research and Practice (pp. 367-385).*
www.igi-global.com/chapter/cognitive-processes-in-fashion-design/187854?camid=4v1a