

ADOPTING AHP IN EVALUATING NURSE SCHEDULING METHODS

Razamin Ramli¹, Adli Mustafa², and Ahamad Tajudin Khader³

¹*Faculty of Quantitative Sciences, Universiti Utara Malaysia, 06010 Sintok, Kedah, Malaysia*
razamin@uum.edu.my

²*School of Mathematical Sciences, Universiti Sains Malaysia, 11800 Minden, Pulau Pinang, Malaysia*
adli@cs.usm.my

³*School of Computer Sciences, Universiti Sains Malaysia, 11800 Minden, Pulau Pinang, Malaysia*
tajudin@cs.usm.my

Abstract: When comparing and evaluating two or more scheduling methods the need to use a multiple criteria decision-making technique arises. Instead of just employing a qualitative approach of evaluating the methods, one can integrate the qualitative and the quantitative data in the evaluation process through the use of the analytic hierarchy process (AHP). Hence, this paper reports the evaluation of two nurse scheduling methods where the AHP technique is employed to support the selection process of these methods. Five decision criteria are used in the process. The main objective of the scheduling methods (models) is to assign work shifts and off days of the nurses in a particular hospital unit such that, it fulfils certain specified constraints while ensuring continuous high-quality patient care services. The first method is a heuristic procedure that is currently in practice. The other one is a prototype in which a memetic algorithm is adopted in the approach. The application of AHP has been found to provide a better transparency of the capability and efficiency of the scheduling methods. Consequently, the memetic algorithm approach stands out to be the better one based on the evaluation scheme.

Keywords: nurse scheduling problem; analytic hierarchy process; evaluation technique; memetic algorithm; health care application