AN APPLICATION OF FUZZY DEMATEL FOR EVALUATING THE PERFORMANCE-SHAPING FACTORS OF AIR TRAFFIC CONTROLLERS

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ABSTRACT

Air Traffic Controller officers (ATCO) are responsible for ensuring smooth airport traffic operations. They are at risk of facing significant challenges such as distraction, exhaustion, stress and more, which can lead to burnout. Due to the complex nature of ATCOs performance issues, these factors can be evaluated under MCDM environment. The existence of many factors or criteria associated to ATCOs performance require further investigation in order to ensure each problem that might arise is well-cater for. The implementation of Fuzzy DEMATEL is a good option to explore problems related to this issue. The integration of fuzzy logic helps the instillation of human judgement that is vague and complex. However, there are limited study that use Fuzzy DEMATEL in analysing ATCOs performance issue. Therefore, the objective is to explore on what criteria that contributed ATCO's performance. Then, the degree of influence for each criteria are calculated, together with the ranking order. The relationship among criteria are also reported using the causal diagram, and Influential Relationship Map (IRM). The result shows that the top criteria with the maximum degree of influence is Attention, followed by Teamwork. While for the third ranking, three criteria sharing the same degree of influence showing that they are equally important (Workload, Situation Awareness and Communication). Among these criteria Teamwork, Attention, Fatigue and Stress falls under the causal group for ATCOs performance. IRM shows how these criteria affect each other with Teamwork and Attention are located in the first quadrant, indicating they should be the main priorities for enhancing ATCOs performance.

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