Efforts to Preventing the Risk of Mental Workload using the NASA-TLX Method for Woodworkers

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Abstract. By relying on several advanced technologies and other automation systems, the development of the Industry 4.0 revolution brings changes to the industrial sector in Indonesia. One of these changes occurs in the production sector, where the process allows for alterations in activities or work cycles. This is common in all workplace environments due to the workload imposed on workers exceeding their capacity at PT. X, a Veneer Preparation stage significantly affects the quality of the produced plywood. Therefore, this process requires high concentration and precision during its execution. The demands for attention and accuracy that must be met are two crucial factors influencing the mental workload of workers. Such conditions can adversely affect the stability of the company's productivity levels and the mental well-being of its employees. Hence, further investigation into the mental states of the workers is necessary to take action by implementing the proposed recommendations for the company's benefit. The data obtained consists of weighting results and ratings given within a range of 0-100. It will then calculate product values by multiplying the weight values by the rating values. Table 1 shows the summarizes the weighting, ratings, and product value. The next step involves calculating the WWL by summing up all the product values obtained for each operator. Then, to get the mental workload score, it calculates the average WWL by dividing the WWL value by the total number of comparisons. Table 2 shows the results of the grouping of mental workload scores. Based on the results of the mental workload calculation using the NASA-TLX method, it can be observed that all operators received scores in the moderate category, which are 48.6, 51.67, 49, 49, 44, and 58.33. Most operators received the highest ratings in the Effort (EF) indicator, which is attributed to the manual nature of the work and the considerable effort required to complete the tasks. On the other hand, the lowest ratings were found in the frustration level (FR) indicator, as the level of frustration among workers is generally relatively low. This is due to the physically demanding nature of the work, which only sometimes involves complex mental considerations. Based on the calculations and analysis conducted, the measurement of mental workload can be carried out in two ways: objectively and subjectively. In the calculations using the NASA-TLX method, it is evident that all operators fall into the moderate category. These values can be influenced by both external and internal factors, such as the physically demanding nature of the work, workplace facilities and infrastructure, and the need for improved work motivation. Therefore, recommendations that can be made include: Maintaining workload distribution, Paying attention to the facilities and infrastructure used in the repair and selection unit, Motivating employees and Conducting regular checks of employees' mental workload to control it effectively.

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