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# Predictive Quality Defect Detection using Defect Tracking Matrix (DTM) for Particle Board Industry

Zero Defect Manufacturing (ZDM) is a quality control tool that prevents defects in the production process. This research aims to predict the cause of product defects in the particle board industry using a defect tracking matrix (DTM) and Principal Component Analysis methods (PCA). Proper quality inspection planning in manufacturing processes has always been a challenge for market competitiveness. In the manufacturing process, quality control is important. To meet consumer satisfaction, there needs to be a suitable quality control tool to predict the cause of defects. DTM is a tool that connects technical attributes and quality defects directly so that the source of defect found during a quality inspection can be easily identified. The application of DTM to predict defects will allow the tracking of defects faster and more accurately during handling. In fact, DTM is a long and less efficient matrix-shaped defect tracking tool that requires simplification. PCA is a matrix simplification tool that is used to convert an original matrix into a new matrix with fewer components without removing the information contained in the original data. Through the integration of these two methods, we obtained a better quality control system for predicting the source of defects. The model was applied to the particle board industry in Indonesia, which has problems in predicting the cause of such defects. In the implementation of the model, 20 technical attributes and 16 quality defects were produced and then processed to obtain the DTM matrix. The group of DTM matrices is stacked into a DTM chain. After obtaining the DTM chain, data dimensions were minimized using the PCA method, and a new DTM chain that was more effective and efficient was formed. From the analysis of the new DTM chain, the causes of product defects can be predicted.

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