عنوان مقاله:

Using Decision Tree Algorithms in Predicting and Improving the Quality of Industrial Products (Case Study: Peugeot 206 radiator)

محل انتشار:

چهارمین کنفرانس بین المللی پیشرفت های اخیر در مدیریت و مهندسی صنایع (سال: 1399)

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خلاصه مقاله:

In this study, we have tried to predict the quality of automotive parts regarding Radiator Peugeot 206 by using data mining and its algorithms. On this basis, the production process is first examined and the criteria that are effective in production are identified. The next step is to build a database based on QC records and the quality of the components. The database consists of 9 criteria for Radiator Evaluation and Qualification Peugeot 206 and Prediction 4012 for training and testing algorithms. These criteria are: Cutting, Machining, Rolling, Cracking, folding, forming and piercing quality, including Working day and Shift quality. The data are divided into three groups in terms of quality control: High quality that the product is usable, Medium quality that the product needs It has corrective action and low quality, which is a waste of production. After the creation of the database using three decision tree algorithms, QUEST TREE, C&R TREE and C5, the database is analyzed. Based on the results of C5 algorithm with 97.8 accuracy in 10 cross validation has the highest quality prediction accuracy. Using these algorithms, the most important criteria affecting quality control and rules lead to the quality of the components specified. The results of the decision trees can also be used to determine nodes with high failure and identify those nodes which can determine the rules that result in the failure using three decision tree algorithms in Fig1 to 3 are visible and can be reduced by creating a waste automation system.

کلمات کلیدی:

Data Mining; Decision Tree Algorithm; Statistical quality control; Quality prediction; Quest tree; C&R tree; C5 algorithm