Chapter 5[1]

Data Mining Applications of Process Platform Formation for High Variety Production

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Abstract: The current intense global competition and diverse customer requirements have been forcing manufacturing companies to produce quickly a high variety of customized products at low costs. The linchpin for companies to achieve efficiency, and thus surviving, lies in the ability to maintain the high variety production as stable as possible. Such stable production can only be achieved by adopting similar production processes to produce the diverse products. Process platforms have been recognized as a promising means for companies to configure optima, yet similar, production processes to fulfill the need for different products. This chapter applies data mining to form process platforms from the existing large volumes of production data in companies' production systems. To meet the challenges encountered in the formation process, more specific data mining techniques, including text mining, tree matching, fuzzy clustering, and tree unification, are incorporated in the proposed methodology. A case study of high variety production of vibration motors for mobile phones is also reported. The results illustrate the feasibility and potential of data mining application in process platform formation.

***Key Words*:** Mass customization, Data mining, Product family, Process configuration, Operations routing, Product variety, Text mining, Tree matching.

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[1] Liao, T.W. and E. Triantaphyllou, (Eds.), **Recent Advances in Data Mining of Enterprise Data**, *World Scientific*, Singapore, pp. 247-286, 2007.