A Manufacturing Decision Support Model Using Productivity Approach

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ABSTRACT

Due to the increase of the external competition pressure and the deteriorationof the internal investment environments, efficient use and effective allocation ofresources become important issues for the management of manufacturing industry.Productivity is a proper and popular criterion to measure the efficiency and theeffectiveness of system performance. Most of research focuses on company levelproductivity, however this paper emphasizes on unit level productivity in order todevelop a productivity measurement, evaluation and decisions support model formanufacturing systems. First, three productivity indices are addressed for manufacturing system productivity measurement and evaluation through the definition of input and output factors. In addition, according to the productivity model being developed, several issues related to manufacturing decisions are addressed, such as equipment investment, make or buy, and special order decision. Based on the tradeoff relationship between input factors and the effects of input factors on system productivity, a framework for manufacturing decision support is proposed which includes three modules of manufacturing decision model, productivity management database and user interface. Through the decisionsupport functions, managers can analyze manufacturing decisions from productivity point of view; therefore, enhance the quality on manufacturing decisions. Finally, an engine assembly system is adopted for illustrating and validating the performance of productivity measurement and evaluation model as well as the manufacturing decision support model being developed. Keywords: manufacturing systems, productivity measurement, productivity evaluation, manufacturing decision support model

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