Research on the Construction of a Case-Based Reasoning System for Outsourcing Expenses Forecasting - The case of DRAM Industry

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ABSTRACT

High-tech industries are being developed in Taiwan over the years, and a supply chain has been well constructed in semi-conductor industry. In DRAM industry, operations of IC packaging and testing are mainly outsourced. Based on practical experience, outsourcing expense is approximately ten percent to forty percent of DRAM products' total costs. It shows the importance of outsourcing expense negotiation. In the past, it is difficult to provide a reasonable expense estimate for reference for negotiation due to the lack of theoretical basis, and thus unable to increase compatibility through effectively reducing outsourcing costs. This study applies Case-Based Reasoning method to construct a forecast system for outsourcing expense. The first step is to construct a database of historical cases of outsourcing expense negotiation. The second step is to classify cases in the database based on particular properties of products. Case-Based Reasoning method then can be applied to search for similar cases in the database and the actual outsourcing expense of those cases are used for the forecast for the new case. Experiment was conducted to examine the performance of the constructed forecast systems and MAPE is used to evaluate forecast accuracy. The results show that Case-Based Reasoning is able to forecast outsourcing expense with good accuracy. Furthermore, the performance is better when historical cases in the database are classified properly based on single product property. The constructed forecast system can provide good forecast of outsourcing expenses for IC packaging and testing in DRAM industry.

Keyword: DRAM industry　Case-Based Reasoning