An Application of Back-Propagation Neural Network in Dry Film Photoresists Sales Forecasting: A Case Study of A Company

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ABSTRACT

Printed Circuit Board, a.k.a. “PCB”, is the building block of all electronic designs which allows the integration of software and hardware for applications like smartphones, computers, network servers, LCD TV, ..etc. Dry Film Photoresist films, a.k.a. “dry film”, is the primary imaging material for printed circuit board fabrication. It was first invented more than 50 years ago. Dry film has since developed into a very mature and highly competitive industry with many suppliers today. In order to be effectively serving the constant-evolving needs of customers and industry, it has been increasingly important to these suppliers on how they can better plan for their company resources and demand forecast. There are two phases of this research. Phase I focuses on the CTQ analysis. It uses both the historic sales performance of the Company in-study and its current forecasting system to develop 13 possible factors. Further analysis is then done to screen these 13 factors down to only critical few (or CTQs) which could have the most impact on the sales performance of this company. Phase II focuses on building predictive models of sales forecasting with the identified CTQ’s. It compares different values of the MAPE by each model, before selecting/finalizing the most accurate and applicable predictive model for its sales forecasting. This study shows that this predictive model has delivered the MAPE value, average between 4.86% and 7.37%, that is better than the MAPE, average at 8.4%, by the current forecasting model used by this Case Company. This predictive model developed in the study has been proven with improved accuracy in sales forecasting, such resulting a much lower cost of manufacturing and definitely a much higher core competitiveness of this Company.

Key words: Sales Forecast、StepwiStepwise Regression Analysisse Regression Analysis、Back-Propagation Neural Network