

Independent study title: An Application of X Technology to Improve Silver Powder Product for Competitiveness: An Empirical Study

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Abstract

The objectives of this study were as follows: 1) to compare the quality of silver powder before and after the implementation of X technology, 2) to examine the production cost and profit margin of silver powder products after the application of X technology by the ABC Company, and 3) to evaluate the benefits of applying X technology to ABC Company's competitiveness, in terms of the customer product system, production cost, profit margin, and market share. This research adopted quantitative and qualitative research methods to deeply explore the application of X technology in improving silver powder products. The researcher collected production data from the ABC Company before and after the application of X technology to silver powder products for quantitative data. Data analysis included percentages, averages, standard deviations, and regression analysis. Qualitative data were obtained through documentary study and in-depth interviews with key informants selected via purposive sampling, including employees and managers directly involved in the implementation of X technology at the ABC Company. A total of 12 individuals were interviewed. Data were analyzed using thematic analysis.

The research found that: 1) There was an improvement in silver powder quality after implementing X technology, with a 1.16% increase in the qualified rate and a 0.39% boost in direct yield. Key quality factors included specific surface area, particle size distribution, and ignition loss; 2) Post-implementation of X technology, there was a slight increase in production costs, but ongoing improvements were expected to reduce costs. The focus was on optimizing the burning reduction ratio for cost savings. ABC Company's profit margins increased significantly after adopting X technology, thanks to higher sales prices and market share growth. Collaboration with customers helped overcome initial cost challenges; and 3) X technology had a significant impact on customer product systems, with the reduction ratio becoming more prominent, reflecting its increased importance. X technology drove profitability by optimizing the reduction ratio, despite initial cost challenges. Market emphasis on particle size differed from customer preferences, indicating optimization opportunities. The adoption of X technology led to varying changes in market share, with the reduction ratio gaining influence. New customer acquisitions expanded market share through collaborative efforts. X technology significantly improved product quality, reduced costs, increased profit margins, and expanded market opportunities, enhancing ABC Company's competitiveness in the silver powder industry.

Keywords: Silver Powder Product, Production Technology, Competitiveness

Student's signature

Independent study advisors' signatures 1) 2)