

# Design, process and commercial benefits gained from AMT

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benefits

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## Abstract

**Purpose** – The purpose of this paper is to measure the relationships between advanced manufacturing technologies (AMTs) categories (stand-alone, intermediated and integrated systems) implementation and design, process and commercial benefits obtained.

**Design/methodology/approach** – A survey is designed with benefits gained from AMT implementation as well as its categories, which is applied to the maquiladora industry. A structural equation model with data from 383 responses is used to measure the relationship between AMT categories and benefits gained using nine hypotheses that are tested statistically significant using partial least squares. Also, using conditional probabilities, a sensitivity analysis reports how low and high levels from AMT implementation influence on the obtained benefits.

**Findings** – Integrated systems are the most important AMT for maquiladoras and have the strongest impact on design, processes and commercial benefits.

**Research limitations/implications** – Data obtained support the model, but results may be different in another industrial sector and countries with different labor culture and technological level.

**Practical implications** – Managers in maquiladora industry must focus their attention on integrated manufacturing systems, because high implementation levels guarantee the biggest probability to gain benefits in design, production process and commercial.

**Originality/value** – The relationship between AMT and their benefits has not been measured in depth, and this paper contributes to understand that problem. In addition, this paper is the first to report a sensitivity analysis that enables managers to acknowledge the probability of obtaining certain benefits.

**Keywords** Performance measurement, Statistical analysis, Manufacturing performance, Advanced manufacturing technology, Manufacturing industry

**Paper type** Research paper

## 1. Introduction

Maquiladora companies, also known as “shared production plants” or “twin plants,” emerged as a new manufacturing operation model, which are mostly located in the Mexico–US border (Munguia *et al.*, 2018). Generally, maquiladoras are foreign-owned companies that temporarily import equipment and raw materials, which are later processed and assembled in Mexico in order to be then exported overseas under preferential tariff programs (Hadjimarcou *et al.*, 2013). Also, maquiladoras take advantage of qualified and inexpensive workforce, different labor laws, and preferential union policies in host countries.

