



## Auto Maker Achieves Remarkable Performance Gains with Axiomatic Design

**Context:** Going up against Detroit and Tokyo, the survival of smaller automobile manufacturers depends on their ability to achieve world-class production/operations performance. One such Asian manufacturer had been producing different kinds of cars since 1968. Axiomatic Design (AD) helped this auto maker achieve remarkable improvements in its manufacturing operations as part of the firm's overall implementation of Lean Manufacturing.

**Problem:** The car maker had been producing the same auto body since 1993. However, when the manufacturer compared its numbers to industry standards, significant deficiencies were found in its body production center in the following areas:

- High work-in-progress
- Inefficient material flow
- Low productivity levels

**Solution:** AD showed engineers how first to attack the deficiencies through decomposition of the problems. In accord with Lean principles, they recognized that any kind of process that did not add value to the product should be considered waste or a non-value-added activity. The structure subsequently developed through AD revealed several sources of non-value adding or waste activities. Using AD, the engineers decomposed all these elements and discovered that the most significant areas centered on the door production and the production-line floor cells which were completely redesigned with axiomatic design. Furthermore, the AD process pinpointed the need for improved support services from other non-production line groups. The flexibility of the new overall design will allow the firm to add future value-adding enhancements to its manufacturing process.

The AD methods provided both a blueprint for implementing Lean Manufacturing principles and a tool for designing the door and floor cells in the production line. The resulting improvements were impressive:

- 50% work-in-process reduction
- 20% cycle time reduction
- Reduced floor space
- 50% reduction in volume of transport
- Reduced traffic

*Axiomatic Design Solutions is a business and technology consultancy that delivers measurable results and value through the application and support of axiomatic design methods as a basis for quality-driven design processes.*

## The Axiomatic Design Process

- Improves the quality of designs
- Facilitates the creative process
- Requirements driven
- Captures design intent and traceability
- Provides early phase risk assessment
- Gives objective metrics for design evaluation
- Reduces the Design-Build-Test-Design Cycle
- Scalable from small projects to very large
- Fully compatible with:
  - Six Sigma
  - QFD
  - Lean Process

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