

# TAGUCHI METHOD IN BIOPROCESS ENGINEERING: *Case Studies*

► *Editors:*

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IIUM Press

# **Taguchi Method In Bioprocess Engineering:Case Studies**

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# Chapter 1

## Introduction to Taguchi Method

*Maizirwan Mel and Najiah Nadir*

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### 1. Background

Taguchi method, also called the robust design method, founded by Dr. Genichi Taguchi, significantly improves engineering productivity. This method helps ensure customer satisfaction and reduces the variation in a process by cautiously considering the noise factors (manufacturing variation, component deterioration, and environmental variation during the product's usage) and the failure cost. Indeed, the overall objective of the method is to produce high quality product at low cost and simultaneously reduce development interval (Phadke, 2010).

In the late 1940's, Dr. Taguchi, a researcher in Electronic Control Laboratory in Japan, performed a significant research with design of experiments (DOE) techniques. Taguchi spent considerable effort on this experimental design to turn it into a more user-friendly, and utilized for the quality improvement of the manufactured products. The Taguchi method is a powerful problem solving system for improving process performance, output and productivity. It decreases scrap rates, rework costs and manufacturing costs caused by excessive variability in processes (Antony and Antony, 2001).

In the USA in the early 1980's, Dr. Taguchi's standardized version of DOE was introduced. It was popularly known as the Taguchi method or Taguchi approach. Nowadays, it is one of the most effective quality building tools in all types of manufacturing activities