

The Second Toyota Paradox: How Delaying Decisions Can Make Better Cars Faster

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John -
This is a resubmittal
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Comments.

Chris

U competitive advantage in the global automotive industry has been its ability to bring new, high-quality products rapidly to market. Simultaneously designing a product and its manufacturing system (often referred to as concurrent or simultaneous engineering of overlapping tasks) is generally seen as the salient characteristic of this competitive edge; Toyota, the most successful Japanese automotive company, is credited as one of the originators of concurrent engineering (CE).¹ To compete, U.S. companies have implemented CE, largely through organizational design, creating highly structured design processes and multifunctional, often collocated, design teams, with intense communication among team members, including supplier engineers.² Several U.S. companies (most notably, Chrysler and Ford) have reduced the length of the product development cycle, in part through such organizational changes.³

Our research has found, however, that Toyota uses a relatively unstructured development process, its multidisciplinary teams are neither collocated nor dedicated, and, in

DEVELOPMENT PROCESS SEEMS EXTRAORDINARY. HOW TO MAKE BETTER CARS MORE. MANAGERS delay decisions and give suppliers prototypes. The authors examine "a method prevalent at Toyota but Toyota designers think about sets of decisions iteratively. They gradually narrow. Through extensive research, case argument — that this apparently is the most efficient developer of autos. ♣

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the case of suppliers, Toyota communicates intensively about product development with a smaller portion of its supply base than do U.S. auto companies (but Toyota suppliers give their customer higher marks for communication effectiveness than U.S. suppliers give their automakers). Moreover, while in most cases CE seeks to freeze specifications quickly, Toyota's engineers and managers try to delay decisions and provide their suppliers with hard specifications very late in the process. And, while conventional concurrent engineering reduces the number of prototypes, Toyota's suppliers seem to multiply prototypes, in some cases to an apparently absurd degree.

The Second Toyota Paradox

In our view, the first Toyota paradox is its production system, which includes delivering just-in-time; breaking production into lots far below "minimum economical order quantity"; having each worker, rather than professional inspectors, check the previous worker's results; allowing any worker to stop the line and installing automatic line