

ABSTRACT

STRETCH TARGETS SETTING IN NEW PRODUCT DEVELOPMENT: MATHEMATICAL MODELS AND ORGANIZATIONAL BEHAVIOR IMPLICATIONS

by

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Classic approaches to establishing product design targets assume that all of the multi-dimensional targets are reachable. However, in a competitive market for complex products, executives often establish targets that they are not sure can be reached. After Jack Welch coined the term stretch targets in 1985, corporations have embraced the concept of stretch targets. A stretch target is a target that is so big and bold that it seems almost impossible to achieve to those who set it. The stretch target approach is sharply different from the classic approaches where targets are set only if there is a strong like likelihood that the target can be achieved and there is a specific method, which shows how to reach it.

One of the most important decisions managers make is how high to set a target. However, “how far to stretch” is a decision that has not been structured and modeled. This issue becomes more difficult when stretch targets are established on interrelated multiple measures. This dissertation presents probabilistic models that can be used to answer the question “How far we should stretch?” The models explore what happens if the stretch target is too high. The models also enable the decision-makers to determine the value of a recovery strategy that involves investing in compressed product development timing if the stretch target approach fails. The base analytic model is a single variable model. The model is then explored to include two variables that are technically linked.

In classical target setting approaches for product development, uncertainty has never been considered while the targets are set. Stretch targets increase the uncertainty surrounding the design team’s ability to reach target. Though decisions may need to be made to scale back or increase the targets in the midst of product development. The organization dynamics that delay these decisions and drive the new targets have never been studied and are not well understood. In this dissertation we present data on stretch targets achievement in several complex multi-year product development teams of a Fortune 100 company. These data document the difficulties that teams have in reaching multi-variable stretch targets. In addition, this dissertation presents the results of a survey of the product development managers who had to cope with aggressive stretch targets set by senior management of the company. These findings are summarized in Current Reality Trees also called causal loop diagrams. They are used to address five hypotheses regarding stretch targets in the company. This behavioral research concludes with a summary of managers’ recommendations to improve stretch target setting and management.