

## Effectiveness with Respect to Time-To-Market and the Impacts of Late-Stage Design Changes in Rapid Development Life Cycles

**Authors :** Parth Shah

**Abstract :** The author examines the recent trend where business organizations are significantly reducing their developmental cycle times to stay competitive in today's global marketplace. The author proposes a rapid systems engineering framework to address late design changes and allow for flexibility (i.e. to react to unexpected or late changes and its impacts) during the product development cycle using a Systems Engineering approach. A System Engineering approach is crucial in today's product development to deliver complex products into the marketplace. Design changes can occur due to shortened timelines and also based on initial consumer feedback once a product or service is in the marketplace. The ability to react to change and address customer expectations in a responsive and cost-efficient manner is crucial for any organization to succeed. Past literature, research, and methods such as concurrent development, simultaneous engineering, knowledge management, component sharing, rapid product integration, tailored systems engineering processes, and studies on reducing product development cycles all suggest a research gap exist in specifically addressing late design changes due to the shortening of life cycle environments in increasingly competitive markets. The author's research suggests that 1) product development cycles time scales are now measured in months instead of years, 2) more and more products have interdependent systems and environments that are fast-paced and resource critical, 3) product obsolescence is higher and more organizations are releasing products and services frequently, and 4) increasingly competitive markets are leading to customization based on consumer feedback. The author will quantify effectiveness with respect to success factors such as time-to-market, return-of-investment, life cycle time and flexibility in late design changes by complexity of product or service, number of late changes and ability to react and reduce late design changes.

**Keywords :** product development, rapid systems engineering, scalability, systems engineering, systems integration, systems life cycle

**Conference Title :** ICMSEM 2018 : International Conference on Manufacturing Systems Engineering and Management

**Conference Location :** New York, United States

**Conference Dates :** April 19-20, 2018