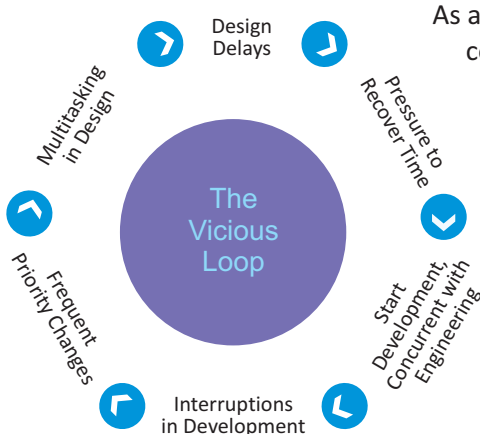# Three Rules
for Rapid New Product Development

by **Satyashri Mohanty**

New product development for auto companies is one of the most complex operations environments due to:

➔ **Design interdependence of various mating parts made by different design teams in OEMs**
➔ **Dependence of multiple vendors developing different components (and their tooling) of the new product**

Due to dependence, any change in one part can have a cascading effect on several other parts. In the initial stage of design, several iterations are inevitable due to conflicting design decisions made by different teams. Designers find themselves making repeated versions of the same design to incorporate the latest change. The problem becomes even more aggravated when design teams switch across different new product projects. Frequent switching across projects coupled with too much iteration adds to the elapsed time and pressure builds up to move to the phase of tooling development as soon as possible.

The Vicious Loop

- Design Delays
- Pressure to Recover Time
- Start Development, Concurrent with Engineering
- Interruptions in Development
- Frequent Priority Changes
- Multitasking in Design

As a solution to the above problem, many companies assume that concurrency between design and development phase will save on time. Unfortunately, this adds to interruptions and iterations during development, and at the same time, interruptions at vendors' add to design urgencies, which add to level of multi-tasking causing a vicious loop of delays and rework.

Due to delays, the level of expediting is very high, which in turn adds to de-synchronization of components for assembly and testing. Towards the end, the pressure to deliver on time leads to products getting into mass production without stabilizing the production. The teething issues eat into production capacity and issues remain unresolved as the development and design team attention shifts to other new development projects.

The solution which isn't

With uncontrolled multi-tasking, coordination becomes weak, and delays are detected late. Managers assume that "better"and more detailed planning and task scheduling is a solution for the problem. However, efforts to make detailed schedules for tasks go waste as plans become haywire within no time. For controlling design errors, managers assume capabilities of people as the real problem. But in an environment of frequent priority changes, errors are inevitable, as switching leads to loss of information.

The TOC approach

Rapid new product development is possible if proper "gating" rules are imposed at design, which means unless the "full kit" of interacting designs is complete and checked, development should not start. This will ensure that development happens un-interrupted without iterations. The concept of this gating is well understood by managers but the pressure of time forces them to break the gating rules.
A company can implement the rule of design gating only when the time to complete the design is reduced significantly. The way to reduce lead time is to cut down the level of multi-tasking in the department. This can happen when the level of open work front is controlled in design. Strict WIP rules, at half of current levels, will help focus on closures and fast issue resolution, which in turn will not only reduce lead time but also release the design capacity.

Once a process of design gating and WIP control rules are implemented, a planning system can be put in place to create synchronization signals across various parts of a new product. By differentiating the touch time of developing a component from the total leadtime, the buffers can be made visible. This approach is different from the traditional approach of planning by task deadline, which only hides the buffers and promotes its wastage in execution. Removal of task level deadlines (while retaining project deadline) also requires a paradigm shift in task management; instead of intervention close to milestones, the new culture requires one to observe flow of work at predefined frequency (daily) and intervene whenever there is interruption, rework or work expansion.

The visible buffers provide signals where level of uncertainty is significant for intervention. The buffer consumption rate provides an early warning and visibility to top management on delays, and as a result, intervention happens early rather than later. The rate of its consumption also provides priority signals to ensure correct utilization of resources for different projects and also ensure synchronization of parts within a project.

The three simple rules of **designfull kit**, **controlled WIP** and **buffer-based planning and execution** can help reduce lead time of new product development by more than half while increasing output by more than 100%.

Full Kit

WIP Control

Buffer Based Panning and Execution

Satyashri Mohanty is a founding Director of Vector Consulting Group.

Vector Consulting Group (www.vectorconsulting.in) is the leader of 'Theory of Constraints' consulting in India. Vector has been working closely with some of the well known FMCG, Engineering Goods, Custom Manufacturing and Auto Components companies to improve their overall profitability through supply chain effectiveness.

Satyashri Mohanty can be reached at: satya@vectorconsulting.in