

## INTRODUCTION

Continuous flow of materials and products in any production operation is a wonderful thing, and lean thinkers strive to create this condition wherever possible. The reality of manufacturing today and for many years to come, however, is that disconnected processes upstream will feed activities downstream. Additionally, many internal processes are currently batch-oriented and function as shared resources. The major challenge in this situation is for downstream processes to obtain precisely what they need when they need it, while making upstream activities as efficient as possible. This is where *leveled demand* and *pull production* are critical.

As I visit manufacturing operations around the world, I rarely see anything resembling level pull production. Instead, I observe progress in introducing continuous flow as well as local stability improvements at the individual process level by means of point kaizen (such as 5S, enhanced process capability, and set-up time reductions).

The reason for this is not mysterious: creating level pull production in an operation of any complexity is not easy. Even within Toyota it took 20 years of hard work and experiments, between 1953 and 1973, to establish the system companywide. A successful transformation requires the coordinated efforts of everyone in a facility looking at the needs of all the product-family value streams. This calls for *system kaizen* of material and information flow to support every value stream.

Fortunately, the basic methods needed for level pull production are well understood, having been developed by Toyota and its affiliated companies over many years. In addition, there is now a considerable base of experience in introducing these methods in firms outside of Toyota. The challenge therefore is to provide a simple recipe for introducing these concepts in your facilities. Based on my experience in converting facilities from push to level pull-based production, I've developed 12 questions you will need to answer to meet the challenge. Not every question will apply in every case, and you may need to deviate slightly as your situation dictates, but I'm confident that by addressing these questions every facility can improve its performance while moving operations to the next level of sustainable achievement.

Only you can supply the courage and leadership to create level pull in your facilities. And much additional point, flow, and system kaizen will be needed after your initial leap. But this workbook provides all of the necessary knowledge to get started and to move you past the critical threshold from erratic push to level pull. I'll be anxious to hear about your experiences, and I wish you smooth sailing on level seas!

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