

Volume	6	Support and Development
Chapter	02	Development
Section	04	Schedules
Key Word Tags	Eliyahu Goldratt, Theory of Constraints	

## BUFFERS ARE SELF-FULFILLING

File No. 6.020406 | 2017-06-01

Quick Summary: Unrealistic schedules, including worse-case estimates, can occur based on each element.

### Abstract:

*It is not uncommon for functional elements to build significant extra time into their schedules to account for unforeseen issues. The feeling is that this approach will help ensure that they meet their commitments. This is a prudent approach but can lead to unrealistic schedules due to each forecasting element adding their own worst-case, buffered time estimates. Although some buffered time will be necessary, it is unrealistic to assume that all activities will require all the extra time allocated. Developing a coordinated, overall schedule with the mutual understanding that some, but not all, activities will require extra time can minimize this issue.*

Several articles in this section and the entire chapter discuss the reality of development schedule slips, missed forecasts, and the associated pressure these events create. No one enjoys missing commitments, and certainly, no one enjoys the criticism and second-guessing that occurs when other's expectations are not met. It is not uncommon for individuals to "protect" themselves from these almost inevitable mishaps.

Two "protection mechanisms" to avoid this situation are commonly used that are diametrically opposed. In one case, the individual or manager simply refuses to forecast their completion date. They rely on the excuse that providing any commitment is impossible until every conceivable detail is fully understood and documented, and no changes can be tolerated. Of course, the state of perfect, non-changing requirements never occurs. A logical extension of this argument is for the individual to suggest that others set the schedule. With other people setting the schedule, there is no feeling of responsibility or accountability and, therefore, a feeling that they cannot be blamed for missing "someone else's" schedule.

The opposite situation occurs when the forecaster adds significant buffers to every activity to account for virtually every conceivable delay that could possibly occur. The result, of course, is a totally unacceptable forecast that no one believes. Unfortunately, the buffer approach often becomes self-fulfilling as described in the tongue-in-cheek axiom: "Activities expand to occupy all available time and resources." This axiom often is extended with "and then some." This extension means that even with more than enough time, the activities are still late!

The brilliant business process author, Dr. Eliyahu Goldratt, discusses this issue in his books, *Theory of Constraints* and *Critical Chain*. If the reader is not familiar with Dr. Goldratt's work, start by reading *The*

*Goal.* You will quickly be hooked and will want to read more. At the risk of greatly over simplifying Dr. Goldratt's concept, the problem with setting overly pessimistic buffers is that they sequentially add-up. This approach assumes that every bad outcome that can happen will happen. Although we jokingly quote "Murphy's Law" that anything bad that can will happen, it seldom applies to "everything." Instead, some activities will be completed ahead of schedule. When this occurs either "work" continues (example, "creeping features") or the work product is passed on to the next group. Unfortunately, that "next group" may not be ready to begin their work because they were planning to start only after the previously forecasted, and highly padded, beginning date was specified.

Goldratt's solution (greatly simplified here) was to ask for realistic, minimally buffered, forecasts from each serial activity and add one, much more realistic buffer, to the end of the project. This approach requires a level of fluidity among interim completion dates and the acknowledgment, with no blame, that some of the activities may slip.

Another key strategy described by Dr. Goldratt is to focus the entire organization on removing the single choke point or weakest link in the entire development chain. Contrary to the classical approach of optimizing every activity, this approach advocates the reallocation of resources to help remove the choke point. The reallocation would likely result in suboptimum performance of the group or individual that is reassigned to help remove the choke point, but that is perfectly acceptable if the overall end result is improved. A useful analogy is considering a chain (hence the name of one of Goldratt's book). With a chain, it makes no sense to reinforce any of the stronger links and neglect the weakest link. Obviously, as the saying goes, "A chain is only as strong as its weakest link." Although everyone agrees with this statement, it is rarely followed in the business world. As discussed in the article in this collection, "Silo is a Four-Letter Word," functional business groups ("silos") often only focus on their individual functional goals and not consider overall, company-wide goals.

Finally, groups involved in the early stages of product development may be insensitive to the long-term impacts of their unrealistically long buffers. The article in this collection, "A 4 Week Slip Always Costs December," provides a back-of-envelope sample calculation of the financial impacts a slip or unrealistic schedule can cause. Using the relay race analogy described in the article "The First Scheduling Step," there is always far more pressure on the anchor, or last runner, in a relay race than on the first or second runner. The anchor runner is expected to make up for any deficits of the others. Early delays or unrealistic early buffers are just as damaging as those that occur later in any process.

Stacking the deck with unrealistic or overly pessimistic buffers may provide short-term, individual accountability success but may plant the seeds for long-term, overall failure.