



The following is a segment from Hal Mather's book How to Profitably Delight Your Customers, written in 1999. It is an outstanding illustration of how an organization can improve lead times by simply reorganizing the way it does work, particularly in the early stages of a process.

Six Ships Tell a Story

I am going to give you a riddle to solve. It should explain some concepts regarding focused versus diffused resources. Six ships are coming into dock to be unloaded. Six docks are open to receive these six ships. Six cranes are available to unload these six ships. I want to unload these ships and get them back out to sea as quickly as possible. While in the docks they cost me money, at sea they earn me money.

They are all going to arrive at the same minute of the same hour of the same day. That is called the law of random arrivals! They have been at sea for a long time so the sailors are anxious to get on shore. They will all dock at the same time. If I use one crane to unload one ship it will take six days to unload it. I can double up the number of cranes per ship (I only have six cranes) and the time will reduce in half. There is no conflict or synergy with multiple cranes. I can use three, four, five or six cranes per ship. The time to unload the ship is reduced proportionately. How should I allocate my cranes to the ships to reduce the total time in dock?

Take a moment to think about this. I get a variety of answers in my courses when I ask this question. Some say it makes no difference, others plump for one solution or the other.

I will do the calculation for you at the two extremes, one crane per ship and six cranes per ship. With one crane per ship all ships are in dock six days for a total of 36 dock days. The average time a ship is in dock is six days. With six cranes per ship, ship one is in dock one day, ship two two days and so on. The total dock days are 21. The average time a ship is in dock is three and a half days. Deploying the same resources correctly cuts the total time almost in half or the same resources could unload over 40% more ships.

Apply the ships analogy to new product design

You have six new products you want quick-to-market. You have six design engineers you could assign to these projects. What should you do with the six design engineers? Put them all on one project, of course. Drive this one project to a conclusion, then move on to the next.

This is the theoretically correct answer, however all designers may not have the requisite skills for every project. Too many people can get in each other's way. And, if your designers haven't worked in design teams before, there will be a lot of friction between the various people.

What the riddle does say, though, is to push towards a few, high priority projects with heavy, dedicated resources. These few projects should be supported by the resources of other specialities needed for the concurrent engineering process. The riddle further says never to let anyone push you into multiple projects all going at the same time. This is a sure route to disaster.

In fact, most companies behave even worse than one crane per ship. They give each engineer six projects to work on or each crane has six ships to unload! The cranes rotate between the various ships, unloading a little from each, then starting again. You can figure out the elapsed time this would take.

The reasoning for multiple projects per engineer is it fully utilizes the engineer's time. Utilizing your engineer's time is not the objective. Getting product quick-to-market is. When each engineer has multiple projects you guarantee slow to market and now your excuse that you don't have enough resources in other departments to do concurrent engineering is valid, but dead wrong.

- [How to Profitable Delight Your Customers](#) by Hal Mather. Pp. 92-93

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