Six Sigma Academy Amsterdam 2017 ©

Exercise topic: Little's Law

While governments are generally perceived to be somewhat inefficient by nature, there are a number of Dutch government institutes that are embracing the Lean philosophy. Already, the municipality of Amsterdam, The Hague and Rotterdam have implemented some level of Lean reform in their operational activities.

A recent inspection of a Dutch municipality showed that on average, there were roughly 4,000 'bezwaarschriften' being processed by a Dutch municipality. 'Bezwaarschriften' are letters from citizens to the municipality in which citizens make use of their right to formally protests a municipality decision and asks for a new ruling. The Dutch municipalities have an obligation to process those letters within a certain timeframe. Not complying to the deadline has serious (sometimes financial) consequences for the municipalities. Furthermore, an audit showed that on average, roughly 2,200 letters were answered per month.

Question 1: What is the average waiting time for a citizen to get a response to his/her letter?

Question 2: If the Dutch government norms are so that 'bezwaarschriften' should be answered within 1.5 months, how can the municipality achieve that goal?

See next page for answers.

Answers:

Question 1: All inputs (letters) lead to outputs (answers). As such, this is a steady state system and Little's Law can be applied. Little's law entails that:

*L = λ * W*

L= Average number of items in system = +/- 4,000

λ = Average arrival rate = +/- 2,200

W = Average wait time in system = ?

W can be calculated by L / λ = +/- 1.8 months

Do note that we are dealing with approximations here. There are two reasons for this. First of all, our input was also given as approximations. We had roughly 4,000 letters and roughly 2,200 were answered per month. That is how lean management works in practice. You often work, due to time constraint, with rough numbers. We are not trying to land a spacecraft on the moon which requires enormous precision. We are trying to cut away waste by a large %, whilst making sure that our fees are only a small fraction of the savings. The second reason is simply that Little's Law is an approximating law by nature.

Question 2:

We can keep L constant and manipulate λ.

In that case:

4000 = λ * 1.5

λ = 4,000 / 1.5 = 2,667

Basically, this means that the number of letters answered per month, or exit rate, should be 2,667 to comply with a 1.5 month deadline. Remember that exit rate and enter rate are treated the same in Little's Law because it assumes a steady state system.

Alternatively, we can keep λ constant and manipulate L.

In that case:

L = 2,200 * 1.5

L = 3,300

Thus, they need to bring down L (the average number of letters in the system or WIP) down from the current 4,000 to 3,300. They would then be able to comply with the deadline norms, given their current processing capability. Bringing the WIP down seems such a bizarre goal to pursue. After all, is it not just a given with which they have to deal? No! WIP is work that is stuck in your system. Why was it stuck? Because they were (over)processing it over and over again! In this particular case, almost all the 7 forms of waste were heavily present in the system. Most present was over processing which was caused by the size of the bureaucracy.

Doing something about bureaucracy is something extremely difficult and can only succeed if you are heavily supported by a powerful management team AND you can somehow make the affected people believe that the reform is not going to go at the expense of their job. Generally, it helps to make the most vocal criticaster co-responsible for the implementation of the reforms.