FAT-TAILED OR THIN-TAILED?

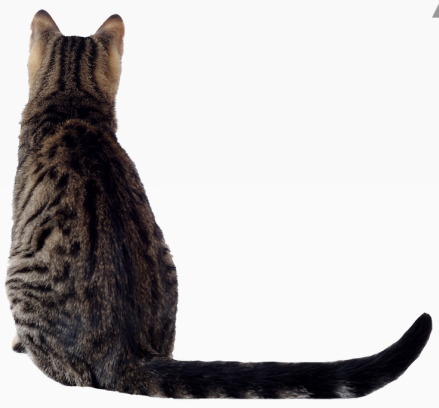
THE DIFFERENCE BETWEEN TWO TYPES OF LEAD TIME DISTRIBUTIONS

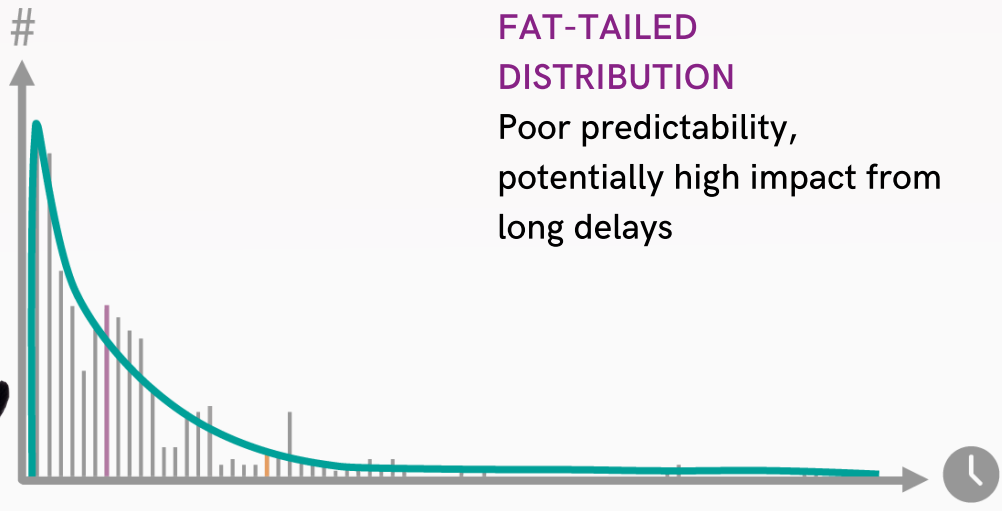
What is a probability distribution?

A lead time probability density function is a "best fit" curve, that shows the distribution of actual data for a lead time from a Kanban system. The x-axis shows the number of days of lead time, and the y-axis shows the occurrence of that time within the number of items pulled through the Kanban system.

"The risk is always in the tail."

David Anderson





FAT-TAILED DISTRIBUTION

Poor predictability, potentially high impact from long delays

$$\frac{\text{Tail (98\% ile)}}{\text{Median (50\% ile)}} > 5.6$$

"Fat-tailed" lead time distribution has a long visible tail which means a poorly predictable and risky process where planning is difficult. You can`t use simple forecasting equations (such as Little's Law) with a fat-tailed curve. With a fat-tailed lead time, just a few high-value data points may screw the mean upward and may dramatically affect the accuracy of a forecast.

The length of the fat tail indicates the possible impact of delay and directly affects customer satisfaction. Even with small probabilities of a 2%- 3% percent (which means a long lead time happens only occasionally), a fat-tail lead time represents long painful delays that may damage customer trust.

THIN-TAILED DISTRIBUTION

Good predictability, low impact, shorter delays

$$\frac{\text{Tail (98\% ile)}}{\text{Median (50\% ile)}} < 5.6$$

The "thin-tailed" lead time curve has a short tail and reflects the process that is reliable, predictable, has shorter delays with lower impact. Trimming the tail on your lead time distribution is the first step to predictability and the ability to forecast reliably.

For more information, visit www.mauvisoft.com.