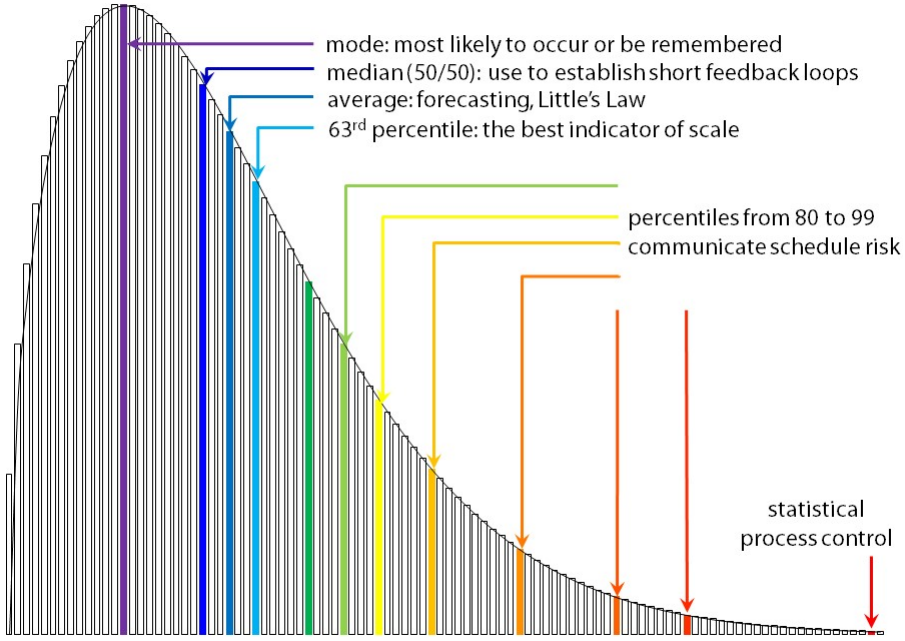
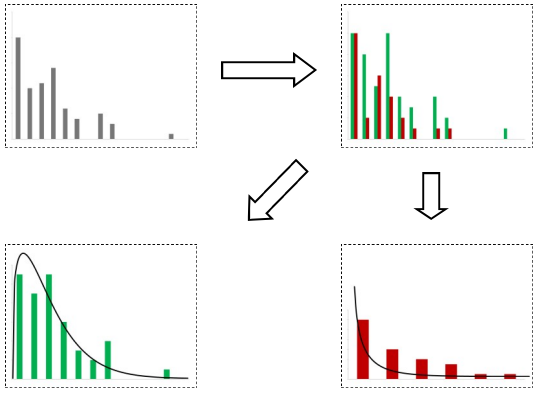
How to Read a Lead Time Distribution



Finding and Using Your Lead Time Distribution



Real-world lead time data often mix different types of deliverables.

Identify your types and risk categories. Separate the data points belonging to different types or categories.

Each deliverable type of risk category will have its own average lead time and pattern of variation.

High-quality data and effective categorization lead to clear, explainable distribution shapes.

Average: 7 days
80% delivered
within 11 days

Average: 5 days
95% delivered
within 21 days

Averages are not enough to communicate the delivery capability! Use at least two points: the average and a high percentile (appropriate for your schedule risk tolerance).

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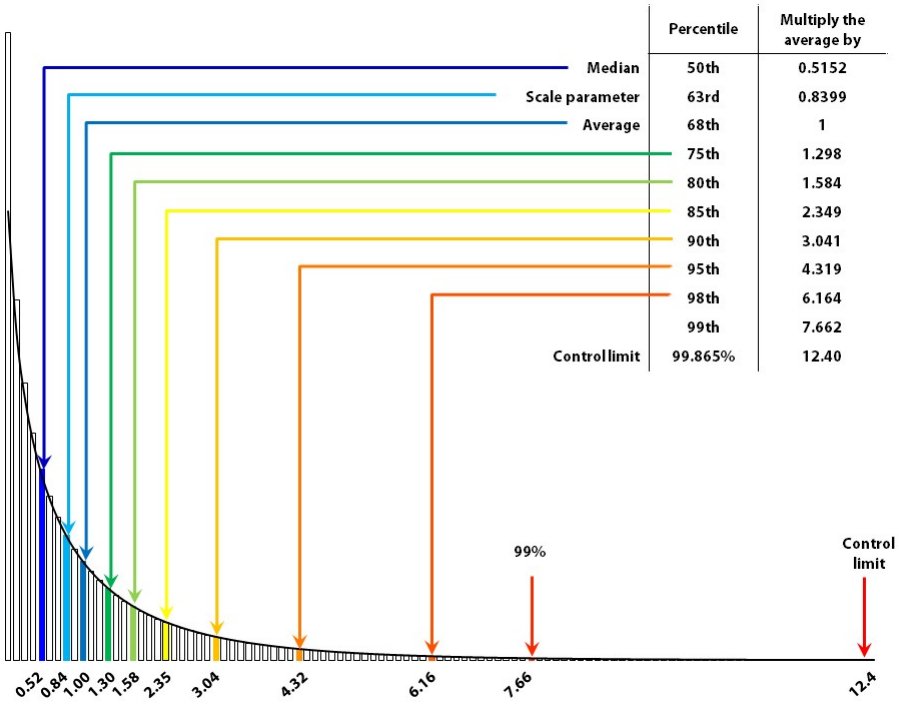
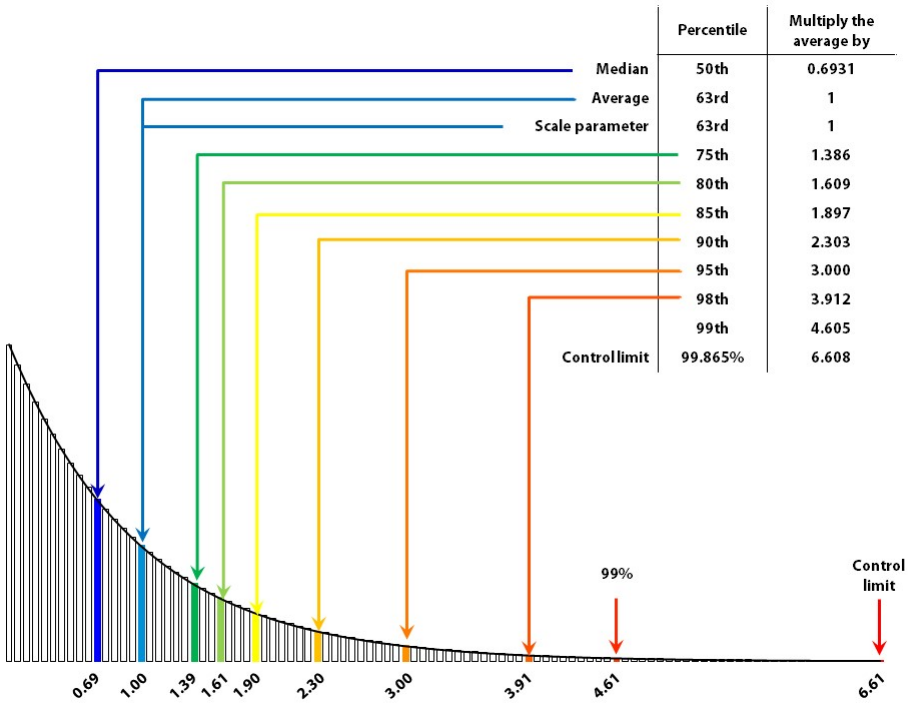
k=0.75 **k=0.75**



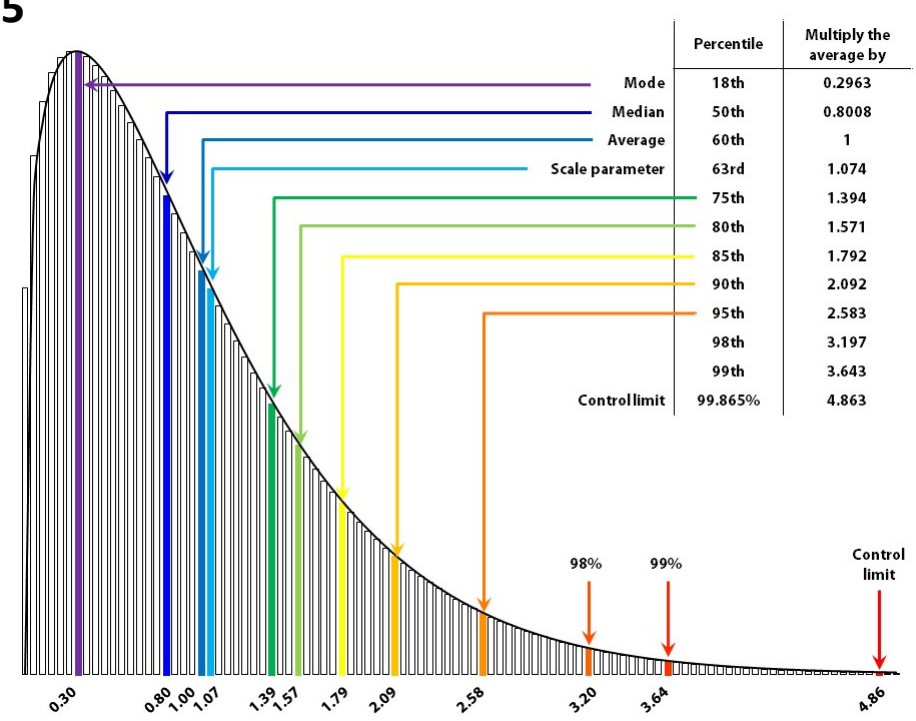
k=0.75

k=1 **k=1**



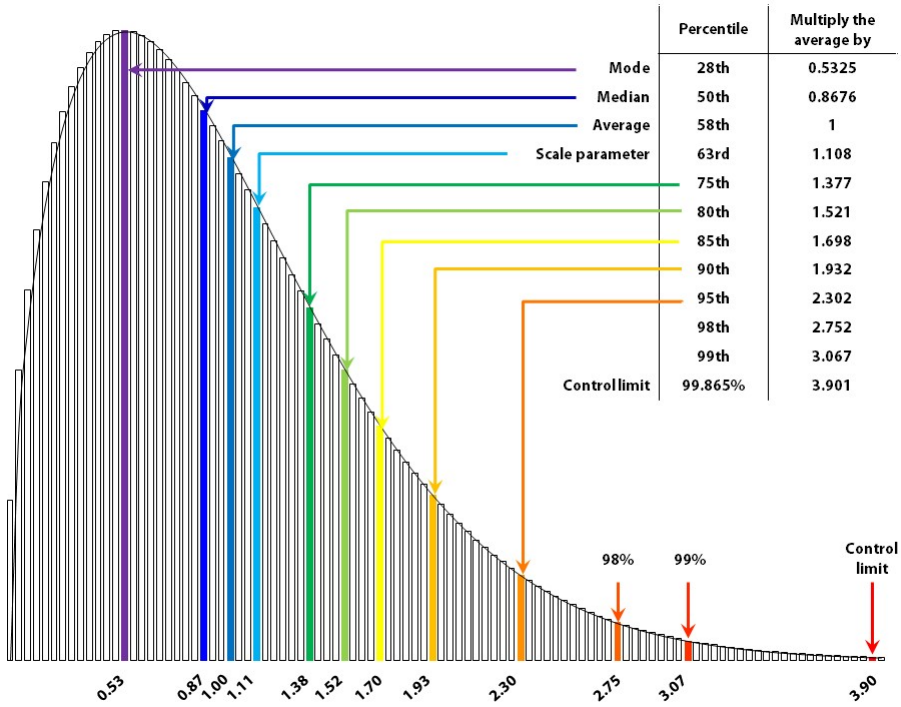
k=1

k=1.25 **k=1.25**



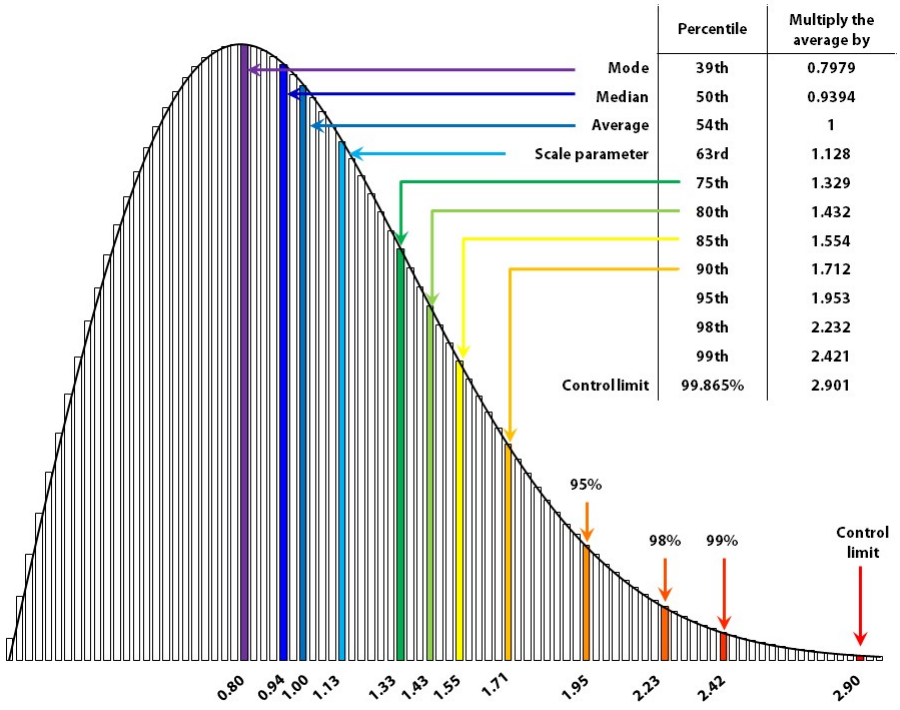
k=1.25

k=1.5 **k=1.5**



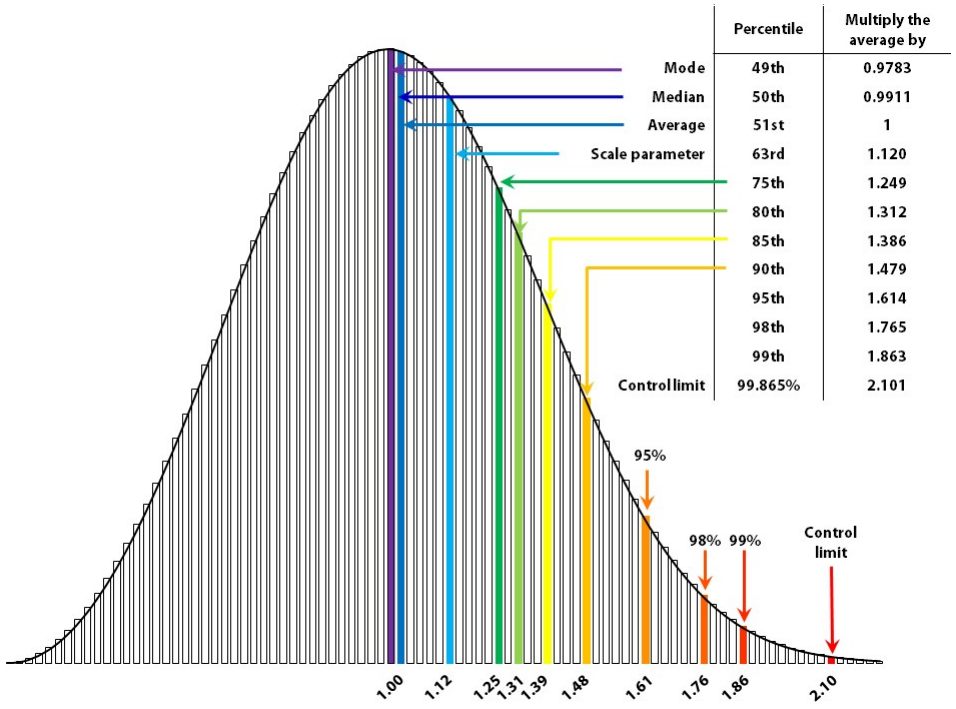
k=1.5

k=2 **k=2**

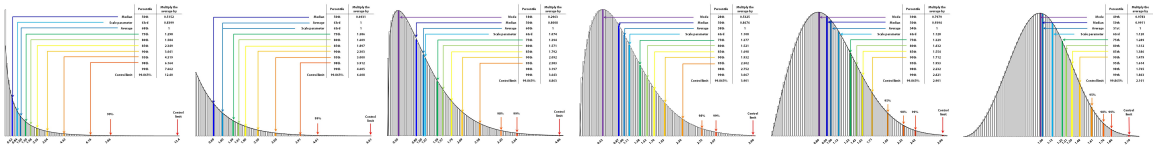


k=2

k=3 **k=3**



k=3



k=0.75 **k=1** **k=1.25** **k=1.5** **k=2** **k=3**

These are the most common patterns of lead time found in professional services work. What type of work is that? A group of professionals works together to discover and deliver a creative solution to some problem on their customers' request. What is lead time? The interval from when we decide to start working on something to when the result is ready.

As more organizations around the world try to make a business of selling such intellectual services, it is important that we understand their nature so that we can make better decisions. When do we need something delivered? When should we start?

An inconvenient truth is, lead time is not a number. It is a probability distribution. Research of real-world lead time data shows the Weibull family of distributions occur very often. Weibull distributions are defined by two parameters, shape and scale. The shape parameter (k) determines the contour of the distribution curve, such as in the six examples above. Once the shape is determined, all key points on the curve bear the same ratios to the average, independently from the scale.

These Forecasting Cards will help you find the shape that fits your process and estimate delivery lead times fitting your scale.

The distributions shapes on the left ($k \approx 1$) are often found in short-duration, reactive work, such as technical support and customer care. The shapes on the right ($k \geq 2$) are found in long-term projects. The middle shapes ($1 < k < 2$) occur a lot in intellectual product development domains such as software engineering and biotech research.