# Either your estimates suck or your job does

A ditch digger digs a one-meter ditch in one hour. How many meters a ditch digger will dig in eight hours?

// plot

Eight, right? If you believe that actual people act like ditch diggers from a third-grade mathematical problem, read no further. Seriously, don’t bother. Just enjoy your C-level management position.

But you chose to read further after all. This means that you know a thing or two about people, mathematical modeling, or actual digging. Yes, small efforts don’t scale. Nobody can dig for eight hours straight without rest, people get tired. There is also heat, rain, there are tree roots, rocks, clay. The shovel can break. There could be a power cable underneath. This all makes work estimation hard and, at some point, impossible.

We can divide all those things into three categories, each not only making estimation harder but contributing to the general flimsiness of the predictive model.

## The quality of the predictive model

Obviously, the eight-hour ditch should be shorter than eight one-hour ditches but how shorter exactly? Let’s gather more data and do a better model.

So let’s say we know that a three-meter-long ditch takes four hours to finish. Good! This gives us a new data point and allows us to promote our model from linear to quadratic.

// plot

Hold on! But now, when we have tiredness accounted for, it looks like, after the seventh hour, a digger start putting earth back into the ditch for some reason. This doesn’t seem right. Perhaps, tiredness in itself is not a linear process either. You can’t get into negative efficiency just by getting tired.

Well, of course, this happens all the time in software engineering. Well-rested people write code, tired people write bugs. But in ditch digging, this shouldn’t happen so we need an even better model.