Getting started with logistics models

I really love creating supply chain and logistics models and said I'd share some tips. I'm going to concentrate on creating models in Excel in this piece - the objective of this series of articles is about using the smallish data widely available in the workplace – data you can collect, analyse and model with affordable tools on your own laptop.

What is a model?

I don't know where I got this definition from originally, but I have seen it more recently it a presentation by Professor Stefano Gazziano of John Cabot University in his Introduction to Computer Science: "Generally, a financial model consists of one or more input parameters along with data and formulas that are used to perform calculations or make predictions. By changing the values of the input parameters, you can do 'what-if' studies to see what happens when the inputs change." So, a flexed budget is a model at its simplest.

For me, logistics models are very similar, with the addition that they are operational as well as financial. Could be as simple as a cost-benefit analysis, or it could be numerous complex worksheets. Thinking about all the various models that I've created over the years, there's been a real span - from the international supply chain to domestic parcels operations, from garments to construction logistics, from congestion inside the warehouse to models of yard operations.

Why do I like Excel so much? I know I've said it before, and I know there are people who laugh at using Excel, but I do like it: it's simple when nothing else is needed and easily shared with other people (a big plus), good for 'what ifs' in something like a cost-benefit analysis, easy to add complexity to models when required, and there are no hidden mysteries - anyone can work through the answers a model has generated. And just because it's in Excel doesn't mean you can't have a geographic element, you just need to consider what information to bring in from other sources.

So what are my tips for getting started?

Tips when getting started on logistics & supply chain models

Put the objective in writing - keep returning to it to avoid mission drift	✓
Have a separate input page, where you can change key figures	✓
Make every variable variable! Don't hide key figures away in formulae	✓
Use existing metrics to get started - for instance, from KPI reports	✓
Keep a record of any assumptions made and the basis for them	✓
Include assumptions on the input page, so you can flex & see the impact	✓
Don't make any one equation too complex – better to break it into two	✓
Difficulty thinking through a formula? Write it down in plain English	✓
Make notes – easier to understand that formula in six months' time!	✓

My first one is to know where you're going. Put the objective in writing and keep returning to it to avoid mission drift. Try to avoid changes in requirements. Some changes can be down to 'good'

reasons, because you've made your boss, say, think about something in a different way, but It's very easy for models to become over-complex when there are changes mid-model.

Have a separate input page or area, and make every variable variable – what I mean by that is, for instance, don't be tempted to include the number of cases per hour as a figure in an equation. Put it on your input page and pick it up from there. Then when someone says, what if we could do that 10% faster, you can just feed in the new figure and let it cascade through the model, rather than go hunting for it in the guts of the model to make the change.

Keep your input as simple as possible - use existing metrics from KPI reports to start with. One of those advantages of Excel is that, later in the process, you can always replace one figure with a link through to another page full of calculations if you need to refine the result, perhaps using data to populate the model for different scenarios.

Record all your assumptions. You will have to make some – they're often needed for filling in gaps. And as I have definitely said before, there is nothing wrong with making an assumption, as long as you know you're making one. State them clearly including notes about the basis on which they've been made. Include them on the input page of your model, so that you can flex them and see what the impact is.

Keep it simple in general. In particular don't make any one equation too complex. And if you're having difficulty thinking through a formula in Excel, I find it helps to just write it down in plain English - how you would do it in real life. And make notes about what you're doing – if you're struggling with it now, what's it going to be like when you come back to it in six months' time?

So that's some tips on getting started. In my next piece I'll talk about some of the techniques you can use, both within a model and in the output. Some of the models I create are about high level concepts, but many of the techniques apply just as much to money saving such as removing pinchpoints – the very first one ever, was for Marks & Spencer's peak planning, examining which DCs were likely to max out, and under what conditions.

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