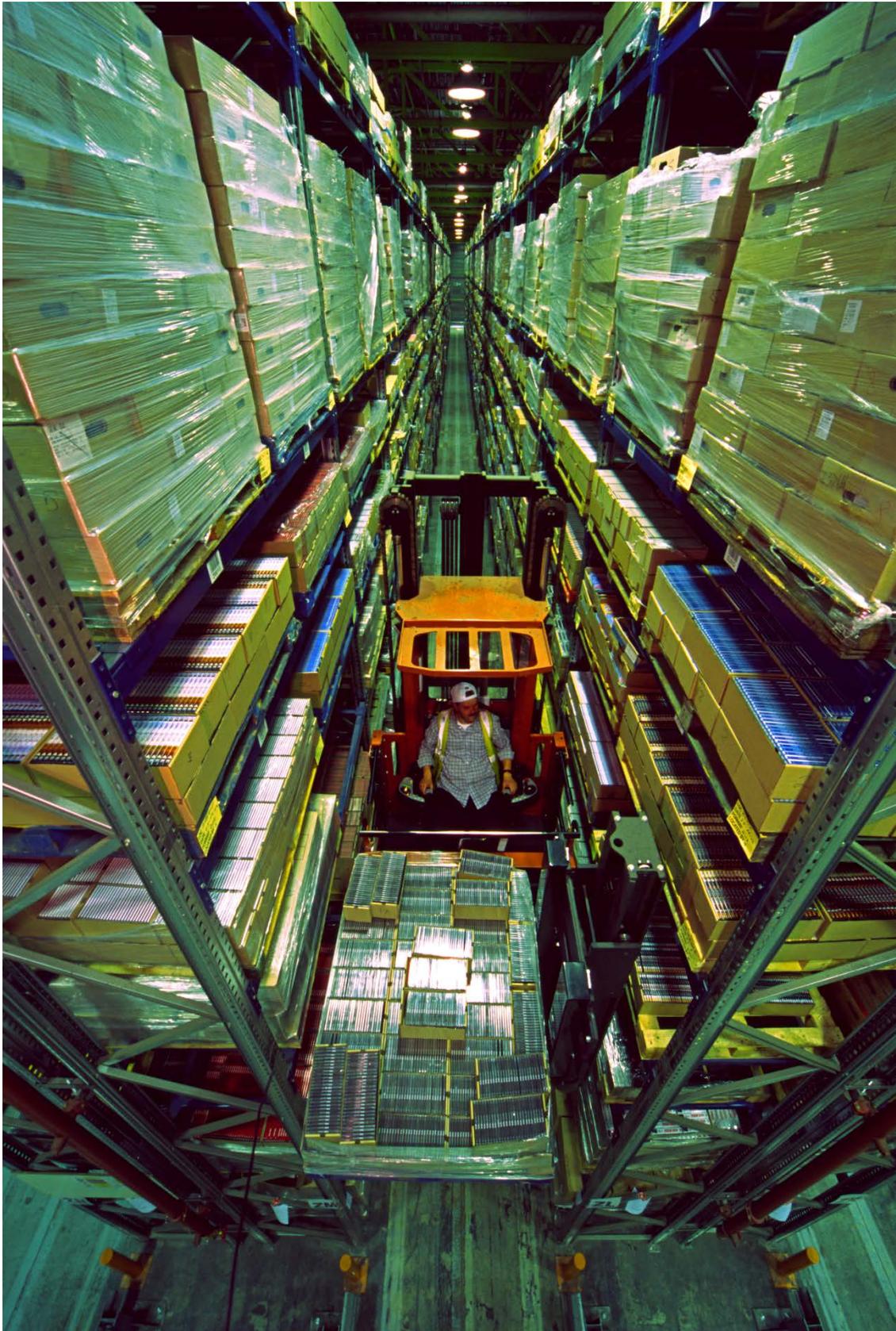


Reducing the risk of strategic decisions



Women in
Logistics UK



aricia
acumen, analysis and agility

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Intro

This leaflet has been compiled as a handout for the Women in Logistics workshop on Reducing the Risk of Strategic Decisions.

Strategy* is about shaping the future, so I'm assuming that whatever decision you're considering is:

- Big ...whatever that means to your company, probably involving investment, and impacting on facilities, staff, customers, etc
- Long-lasting ...requiring an element of projection or forecasting
- And involves development or change - not just more of the same ...so it will probably require looking outside, as well as inside the company, for information

Appropriate, available data and strong analysis techniques have a key role to play in strategic decision-making, reducing risk by putting facts and figures around the options and trade-offs. And some of the techniques I'm going to describe below can be applied to and inform day-to-day analysis.

*Dictionary.com includes the following in discussing the meaning of strategy: In military usage, a distinction is made between strategy and tactics. Strategy is the utilisation during both peace and war, of all of a nation's forces, through *large-scale, long-range planning and development*, to ensure security or victory. Whereas, tactics deals with the use and deployment of troops in actual combat.

Using data and analysis to reduce risk

Today's Women in Logistics workshop has been about two aspects:

- Reducing risk **of** using data, and
- Reducing risk **by** using it

Namely

- What do you need to do with your data to avoid making misleading deductions? And
- How can you then use that data to model options to reduce the risk in the decision you need to make?

Some typical steps in modelling outcomes prior to decision include: data collection, deducing relationships and applying trends, making assumptions, creating a base case, calibration, examining options, sensitivity analysis, break points, gross error checks, and other analysis including normal risk analysis.

These steps are explored in the following sections and there is a checklist at the end of the leaflet.

Data collection

It's easy to get the data you want, right? Actually, this is often the most challenging and time-consuming element of an assignment, and so I never apologise for spending time on the subject. Just collecting together the necessary data can be a challenge and a project in its own right...

There's always some piece of elusive data – something that doesn't exist, data from different systems, average snapshots in KPI-type report, information overload so that some sort of sampling is required (see further on), a need to get information from external parties such as suppliers who may have no interest in the outcome of your project (it may not benefit them!) or internal parties who you need to collate information manually as it's not currently contained within a system... Or a need to extract it from systems where the IT department tell you that it will take weeks, a special form and the CEO's signature!

For more thoughts on the area of data collection you can download my leaflet on Data Collection for Outsourcing Projects, which was prepared for CILT's Outsourcing & Procurement Forum: <http://bit.ly/DataForOutsourcing>

Data cleansing

Once you've got the data, you then need to identify and address all the issues. Typical issues include: missing data, formats of postcodes, text versus numbers, gratuitous formatting, keying errors with manual data, misunderstanding column headings, multiples names for single categories (particularly the "Russian doll" of pick / transit units), negative stock, mismatches between files, dimensions (always seems to come up!), units of issue, units of measurement...

And you will need to make decisions about things like outliers – are they wrong or real.

External data

Projects that are about developing the business will probably require you to look outside your own company to enable you to explore some of the options. You may need to model elements you don't currently have within your operation – try talking to prospective suppliers and see how they can help you.

And you may need information in areas such as warehouse property prices, wages, energy and fuel costs, transport costs for truckloads, pallets and parcels, international costs such as shipping rates and add-ons, exchange rates or inflation. So, here's a link through to the Logistics Buyer's Toolkit, again prepared for the CILT Outsourcing & Procurement Forum:

<http://bit.ly/LogisticsBuyersToolkitJan2014> - although it was compiled in 2014, there are only a couple of links that have become redundant, and it's so good I use it myself! And if you're a member of The Chartered Institute of Logistics & Transport, don't forget CILT Knowledge Centre.

Think carefully about how you include market data and other external figures, and start to collect the data early in the process. The information available is often not quite what you want, a bit broad brush, and not replicable exactly if you need to update your calculations.

Deducing relationships

If there is a need to forecast what the future might look like, there will be a need to deduce relationships from current data and then project those relationships into the future. In deducing relationships, make sure that you look at your data on graphs and on maps – visualising your data helps you spot patterns, trends and abnormalities, and helps you think.

Be careful of averages, which can hide the real story. But don't try to be too complicated or clever with trends. Excel allows you to plot trend lines based on your data, view the equation that is producing the trend line and the r-squared value to assess the closeness of fit to your data. Just because the r-squared value shows a really close fit with a complex polynomial equation doesn't mean that your trend line will help with forecasting what the price of fuel might do in the future, for instance.

You will want to use your most recent data to create trends, so that it best reflects what you do now, so how to check the results? It can sometimes be appropriate to project your trend back in time, beyond the period you used to deduce the equation. How accurate is it? What sort of margin of error is likely to result? Remember to review this when you come to sensitivity analysis.

Sampling

Although Dunn Humby is now said to have “gone granular”, analysing all the data available, it's also said that Edwina Dunn and Clive Humby made their money by realising that you could analyse just a proportion of the Tesco Clubcard data and still get a very high degree of accuracy.

Sampling can be really helpful, not just in reducing the size of the data set to be analysed, but also in checking the veracity of deduced relationships. In Excel, the function Rand() will create a random number between 0 and 1 (tip: it does recalculate the random numbers, so if you want to keep a set for future reference, you need to copy and paste special the values!). You can use this in a couple of different ways:

- To select a number of random samples from your data and compare the deduced relationship from the different samples – do they tell you the same thing?
- Or to select a sample to calculate a trend between two variables, and then use the remainder of the data as a check – apply the deduced relationship to the independent variable and compare the calculated results are to the values of the dependent variable in the actual dataset. How close are they? Are you happy basing a decision on these results?

Assumptions

Assumptions are often needed for filling in gaps. The saying is “ASSUME makes an ASS out of U and ME”, but assumption is not a dirty word... Provided you know you’re making assumptions, you state them clearly as such and you know the basis on which you made them, then you can always revisit them and see what the impact of a different assumption in a particular area might have as part of your sensitivity analysis.

Where you haven’t got hard data, do things like interviewing key staff in that area. Try to ask open questions and capture gut feel. It’s always good to “triangulate” – find out what the answer to a question from several angles, but it’s particularly important when you’re relying on say-so and hearsay. Then think about what you’ve been told. You need to be able to sift fact from opinion and opinion from fiction – it’s as important as your skills in analysing data.

Also, be careful not to assume a relationship exists between two variables just because there is a close relationship.

Building a model

If you’re building a model in Excel, have separate input page/s/area and make every variable and assumption able to be varied – if you don’t, you can be sure that someone will want to explore some aspect you didn’t allow for (you can hear the voice of bitter experience here!). Changes in variable should cascade through the model – again, I find it useful to have a separate output page if possible.

Keep it simple – in particular don’t make any one equation too complex (again, that voice!). If you’re having difficulty thinking through a formula in Excel, I find that it helps to write down in plain English how you would do the calculation in real life.

Calibrating the base case

Unless you’re exploring a completely new business area with a completely new operation, it’s important to have a base case to measure the impact of change, and it’s also important that you understand how accurately it reflects your current reality. Do you get the right sort of cost levels if you have your current pick volumes, pick rate and wages, in your current building, with your current size of trucks carrying out the same number of deliveries? ...or a similar scenario if you are looking at, for example, the international supply chain?

Before you consider your model ready to go, make sure that you’ve calibrated your base case. If there are differences between current costs and the model, you may wish to fine tune your model or you may be happy to understand that there are differences and factor those in when reviewing results. Again, something to feed into sensitivity analysis...

Sensitivity and other analysis

As you'll have already detected from the number of times it's been mentioned, this is an important area. Don't take the output as the answer. You will need to carry out sensitivity analysis – what-if's. Key areas include: external factors over which you have no control (exchange rates, fuel prices...), internal figures which are not as robust as you might wish, and forecasts which by definition are only estimates. Your sensitivity analysis also needs to include 'baskets' of change – multiple variables changing – what if the price of property does this, but the price of fuel does that?

And as well as sensitivity analysis, it's also useful to understand the break points – at what point would I make a different decision?

There will also be other analysis you will wish to carry out – benchmarking against other departments or companies, discounted cashflow, and risk analysis of the types covered in other Women in Logistics presentations and workshops today. I find PESTLE a useful acronym - what Political, Economic, Social, Technological, Legal and Environmental changes could impact?

And, again, that risk analysis will feed back into the sensitivity analysis.

Carry out checks

To check your output, it can help to approach the answer from a completely different direction. If you've carried out detailed bottom-up analysis, try doing a top-down guesstimate to see if it comes to roughly the same answer.

Carry out what pilots call 'gross error analysis' – did you expect the answer to be that sort of size (10Ksqm v 1m, £1m v £1bn).

Results

The output of your analysis and modelling is what is going to be used to make decisions. So it's important that you think carefully about how you're going to present the results to emphasise the key points.

In the same way that visualising data can help you to understand it, so too can visualising the results. Is it a question of pulling out figures into a report, or do you need to present it as maps, graphs, charts? I used to joke that conditional formatting in Excel was how I made half my money ...until Microsoft made it easy!

Try not to have too many options, but if you do have a number, think about how you're going to analyse the results of your results.

Overleaf you'll find some suggested steps for undertaking this type of exercise.

14 Steps for using modelling to reduce the risk of strategic decisions

Data collection – allow plenty of time for this element of any project.	✓
Data cleansing – a necessary step, and with decisions to be made: outliers – wrong or real?	✓
Deducing relationships – be careful of averages, which can hide the real story, and of assuming relationships where there are none.	✓
Applying trends – use Excel to deduce trends, but don't try to be too clever with over-complex equations. Test your trends against additional data, if possible.	✓
Making assumptions – you will have to fill in gaps – make sure you state them clearly.	✓
Make every variable a variable on an input page which cascades changes through the model.	✓
Keep things simple – it's better to have two simple equations than one complicated one.	✓
Create a base case, calibrate and fine tune as necessary – if it doesn't match the current operation, understand why it's different.	✓
Examining options – try not to have too many!	✓
Sensitivity analysis – external factors, internal figures which lack robustness, forecasts, and 'baskets' of changes – what if property prices go up and fuel goes down?	✓
Break points – what's the point at which you would make a different decision?	✓
Checking – carry out high level calculations that tell you if you're in the right ball park.	✓
Presenting results – think about how you're going to get the key points of the options across.	✓
Risk analysis – carry out PESTLE-type analysis and feed into the sensitivity analysis.	✓



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Aricia is a logistics consulting company providing advice and working on projects for a household-name client portfolio with a strong track record of results. We carry out assignments in all parts of the supply chain - warehousing, transport and international logistics, specialising in data analysis / visualisation including mapping, modelling supply chains and industry research.

Established in 2001, Aricia enjoys a very high level of repeat business. Principal, Kirsten Tisdale, has over twenty years' experience of logistics management and projects, a corporate background, and has worked on both sides of the logistics relationship, in customer companies and logistics providers, as well as carrying out non-logistics assignments.

Our clients are typically planning to make change in their logistics operations and need to make decisions. We help to provide direction and reduce risk by putting facts and figures around options.



This piece has been written for the 2015 Women in Logistics conference on Managing Supply Chain Risk on 26 June 2015 by Kirsten Tisdale, principal of Aricia Limited