Understanding and managing supply chain risk

A board-level challenge

Will Harman and Steven Barr

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Welcome – Tim Lawrence – Member of PA’s Management Group
Agenda

• Supply chain risk in the real world
  Will Harman

• Why it’s so difficult to make supply chain risk management work
  Will Harman

• Insights from a leading-edge supply chain risk project
  Steven Barr

• Practical steps to more effective supply chain risk management
  Steven Barr

• Open discussion and next steps
  All

• Close of the formal discussion
  Graham Collins

• Drinks, networking and a small survey
  Justin Hughes
Supply chain risk in the real world
Why is supply chain risk so high on the agenda?

- Research* has shown that the frequency of natural and man-made disasters has risen sharply in recent decades. The cost of these events has risen tenfold since the 1960s.
- Longer, more complex supply chains are more vulnerable.
- Smart phones, YouTube and other technologies can highlight risk events across the globe, rapidly and easily.

*Robust Strategies for Mitigating Supply Chain Disruption
– CS Tang, 2007

What risk events have you experienced? Were they ones you expected?

Bangkok volunteers fortify levy as Thai floods shut plants, disrupt supply
– Bloomberg

After Japan Quake, carmakers face paint shortage
– Wall Street Journal

Horse meat found in Tesco burgers: Animal’s DNA also discovered in Lidl, Aldi and Iceland beef products
– The Mirror

‘Marmageddon’ over as New Zealand shops re-stock Marmite
– BBC News

Japan discovers large quantity of rare earth, hopes to break China’s chokehold on supply
– ExtremeTech
Supply chain risks have a growing profile, but businesses are struggling to respond

• The latest edition of *Supply Management* notes that “90 per cent of firms fail to carry out a risk assessment prior to outsourcing”

• Our own supply chain risk survey* and client work indicate that virtually all organisations are looking at supply chain risks, but on average they have a “low” to “medium” risk management capability

Supply chain risk capability spectrum

- **No risk management**
  - No supply chain risk management in place

- **Qualitative risk management**
  - Relies on “feel” and experience

- **Quantified risk management**
  - Cause and effect, probability and costs/benefits understood

- **Quantified risk management incorporating uncertainty**
  - Recognises and can address gaps in the data

How are your businesses doing? What challenges do you face?

*PA’s supply chain risk survey is based on workshops and interviews with major firms in the Energy, Defence, Pharma, Auto, Aerospace, Consumer, Food and Beverage sectors*
Why it’s so difficult to make supply chain risk management work
A robust process is not enough to drive effective supply chain risk management. There are formidable practical challenges to overcome at each step.

Conventional risk management typically follows three steps:

1. **Identify risks**
   - Identify the events which, if triggered, will cause problems.

2. **Assess and prioritise risks**
   - Assess the probability of occurrence and the severity of impact, and prioritise each risk.

3. **Manage risks**
   - Transfer, avoid, mitigate or accept risks, and monitor them.

When applied to the supply chain, each of these steps presents formidable challenges:

- Supply chains are often larger and more complex than they appear, making risk identification difficult.
- Given incomplete information, risk assessment using simple Red / Amber / Green scoring of risks creates a false sense of security.
- The lack of robust analysis makes it difficult to justify any risk management action which costs money.
Supply chains are often larger and more complex than they appear, making risk identification difficult.

Recent history shows that supply chain risks often emerge from lower tiers of supply (that is, suppliers’ suppliers, or their suppliers).

The challenge for supply chain managers is that the number of firms involved in any given supply chain grows exponentially through the tiers of suppliers.

Also, suppliers are often reluctant to share information about their own suppliers with the customer.

It is not surprising that firms know little about their supply chains, or the associated risks, beyond Tier 1.

**Merck’s Xirallic plant at Onahama, Japan** is a Tier 4 vendor for most car manufacturers, but when it was shut down by the tsunami in 2011, it disrupted global automotive assembly for 6 months.

When **Tesco** discovered horsemeat in some of its products, Tesco’s technical director said: “It was impossible to check the supplier in Poland as we didn’t know it existed.”

When **Findus** discovered horsemeat in its beef lasagne, it alleged that the horsemeat was entering the supply chain via a Tier 3 supplier in Romania, by way of Spanghero and Comigel.

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**A typical supply chain for a medium or large business making or trading goods**

(Drawn to scale)
Given incomplete information, risk assessment using simple red / amber / green scoring creates a false sense of security

- Supply chain risks are often scored using simple ‘traffic light’ or red / amber / green indicators
- In a multi-tier supply chain, information is often scarce. And this results in over-use of the ‘amber’ score
- Our experience is that over-use of ‘amber’ scores leads to systematic under-estimation of risks
- Vague interpretations of risk indicators also hamper risk assessment
  - For example, is it less risky if a company is family-owned or a PLC…? 

## A classic “Traffic light” risk assessment

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Legend:
- Red: High
- Amber: Medium
- Green: Low

![Diagram](image-url)
The lack of robust analysis makes it difficult to justify risk management steps which cost money or time, or limit options

• Many (although not all) of the steps recommended to manage supply chain risks cost money, or conflict with other aims of the business
• Without a robust risk evaluation in place, it is impossible to assign a value to the avoidance or mitigation of a risk
• Hence mitigations either can’t be justified, resulting in business inertia, or the wrong ones are chosen, leading to false reassurance
  • Should every food retailer own its own farms to provide total visibility of its supply chain?
  • Should manufacturers only source locally?

Risk management often involves trade-offs

In a recent report* Zurich, a leading supply chain risk insurer, proposed risk management actions including:
  • Reducing global sourcing and outsourcing
  • Adding multiple suppliers for a given item
  • Adding inventory
  • Adding redundancy
  • Reducing reliance on just-in-time systems

Insights from a leading-edge supply chain risk project
Working with an automotive client, we have developed an approach which overcomes challenges at each stage of the process.

**Identify risks**
- Visualise complex inter-dependencies
- Target key unknowns

**Assess and prioritise risks**
- Make sense of data, models and expertise
- Analyse probability and uncertainty
- Support informed stakeholder dialogue

**Manage risks**
- Demonstrate the business case
- Implement key actions
- Maximise stakeholder buy-in

**Benefits to the business**
- Avoid costs of risk
- Avoid reputational damage
- Reduce costs of risk mitigation

- Avoid wasted research
- Speed up the process and minimise errors
- Deliver assured decisions
- Enable agile response to future developments
We identify risks based on what the business knows – not what it thinks it knows

Evidence =
+ Historical performance data
+ Predictive modelling
+ Expert judgement

PA's PerimetA toolkit uses Italian Flag graphics and state-of-the-art algorithms to analyse uncertainty as well as probability of performance

Q
How relevant is past experience in an uncertain future?
What assumptions have we made?
How ‘expert’ are the experts?
How much do we trust each source?
How do we deal with conflicts?
We bring rigour to the assessment and prioritisation of risk, through multiple tiers of the supply chain.

PA’s PerimetA software provides a robust analytical framework for:

- Assessing risk for any KPI at any level of your business and your supply chains
- Modelling dynamic interactions and common cause risks
- “Propagating” evidence (probability) and lack of evidence (uncertainty) through the hierarchy using a powerful and mathematically rigorous calculus
- Visualising realistically the risk status of your business based on all available evidence
Our approach creates actionable insights and supports clear solutions to deliver effective risk management.

We integrate our supply chain risk management expertise with your systems, as in this example:

- Visualising key risks against business KPIs for effective communication
- Enabling drill-down to root causes of risk issues
- Supporting targeted negotiations and collaborative solutions with suppliers
- Clarifying the value of risk mitigation action and the business case for better risk management
Practical steps to more effective supply chain risk management
Not all of you will need or want to bring in consultants… so what can you do?

- Consider all of the **different dimensions of risk**
- Consider the **risk indicators** you are monitoring. Is your interpretation robust?
- If information is incomplete, **don’t assume the risks are “Amber”** – are there any major knowledge gaps you can research and fill in?
- **Avoid relying on spend** as a proxy for the importance of a supplier to your business
- Consider risk **through the supply chain** – not just at Tier 1
- **Don’t assume that you are alone** – the largest firms and governments are frequently taken by surprise
- **Empower staff to respond quickly** …. The ability of the business to minimise the impact of risks *after they have occurred* is often important

### Dimensions of supply chain risk

**Operational** – disruption to supply – e.g., natural disaster

**Strategic** - Lasting impact on overall business – e.g., theft of IPR

**Quality** - Affects production, product or service – e.g., contaminated materials

**Compliance** - Impact on reputation, ability to trade – e.g., dealing with businesses which are breaching sanctions

**Financial** - Impact on revenue, cash flow, profit – e.g., commodity price movements
To discuss how PA’s supply chain risk management approach can help you to step out of the unknown, please contact one of PA’s experts.

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