



21 September 2020

## Supply chains

### Chartered Institute of Internal Auditors

Supply chain management has become increasingly global and more complex, making risk management more challenging. This guide explains some of the key concepts around value and supply chains and looks at internal audit's established role in the procurement cycle. We examine the challenges facing internal audit in a volatile and uncertain set of circumstances.

Terms and definitions - value chain

Supply chain

Supply chain management

The emergence of global supply chains

Organisational relationships and dependencies

Pressures on risk management

Internal audit's established role in the supply chain

The extended supply chain and challenges for internal audit

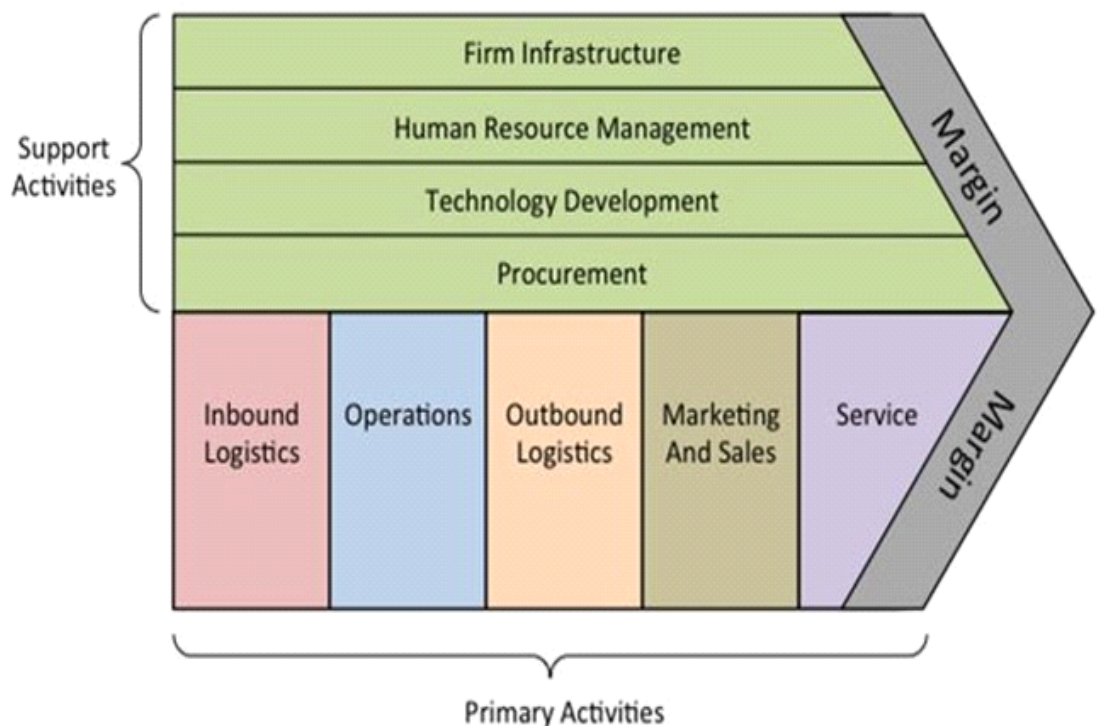
---

### Terms and definitions

#### Value chain

Changing business inputs into outputs to create something of greater value is of fundamental importance to organisations and has been described by Michael Porter (in his 1985 book *Competitive Advantage*) as the value chain.

Porter refers to two types of activity common to all organisations. Primary activities that relate directly to the physical creation, sale and maintenance of a product or a service and support activities that provide the back office building blocks that enable the primary activities to operate. This is shown in the table below.



The value chain is a useful tool as it breaks activities into strategically relevant pieces to reveal a fuller picture of the cost drivers and how profit (margin) is achieved. It also prompts evaluation and new ideas to add further value for customers and can be used by internal auditors as a way of cross-checking risks and establishing an audit universe.

However, a limitation of the value chain is that it looks at value creation at the individual organisational level. It doesn't reflect how value is created through complex inter-organisational relationships, in particular ones that operate on a global basis.

## Supply chain

The supply chain is generally regarded as an extension of the value chain as it includes the additional steps from the producer of the good and services to the customer. Although some definitions of the value chain also include this wider perspective making value chain and supply chain interchangeable creating the potential for confusion.

For example, Gereffi and Fernandez-Stark 2011, define value chain as the “full range of activities that firms and workers do to bring a product from its conception to its end use and beyond”.

Quite often people also confuse the term logistics with supply chain. In general logistics refers to the collection, storage and distribution process whereas the supply chain incorporates these activities and goes much further by including multiple companies such as suppliers, manufacturers

and retailers.

The supply chain therefore recognises every company that comes into contact with a particular product or service and encompasses all the companies manufacturing parts for the product, assembling it, delivering it and selling it. Subject to commercial, business continuity and crisis management arrangements, parties in the extended enterprise can impact the risks and reputation of an organisation.

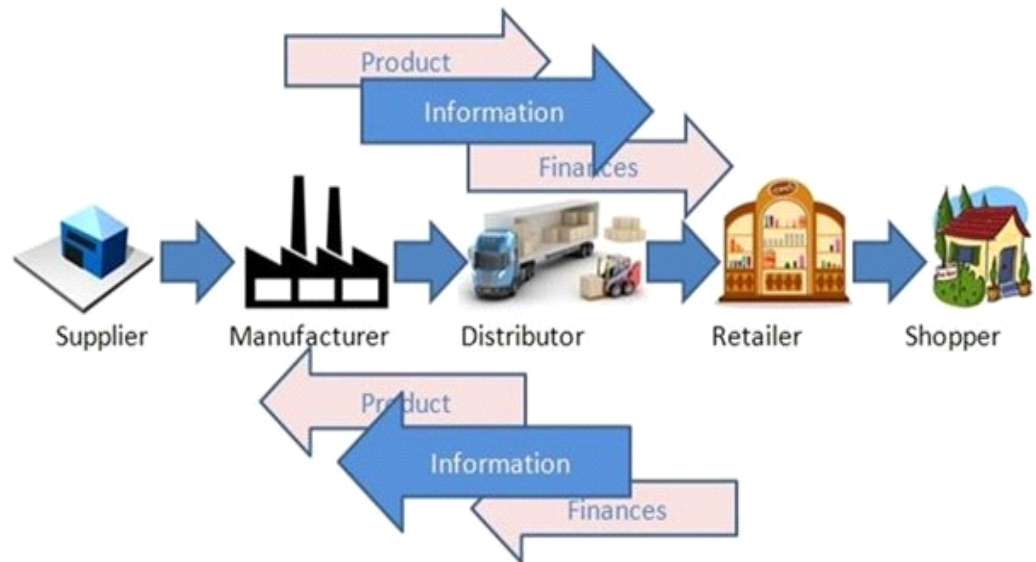
---

## Supply chain management

Creating goods and services from scratch and delivering them to customers using various routes to market has always been a complicated process. It necessitates effective planning, organisation and coordination within and between organisations.

It is defined by the **Institute of Supply Chain Management (IoSCM)** as “the oversight of materials, information and finances as they move in a process from supplier to manufacturer to wholesaler to retailer to consumer. Supply chain management involves coordinating and integrating these flows both within and among companies.” This can be shown using a simple supply chain management diagram.

### Supply chain management



---

## The emergence of global supply chains

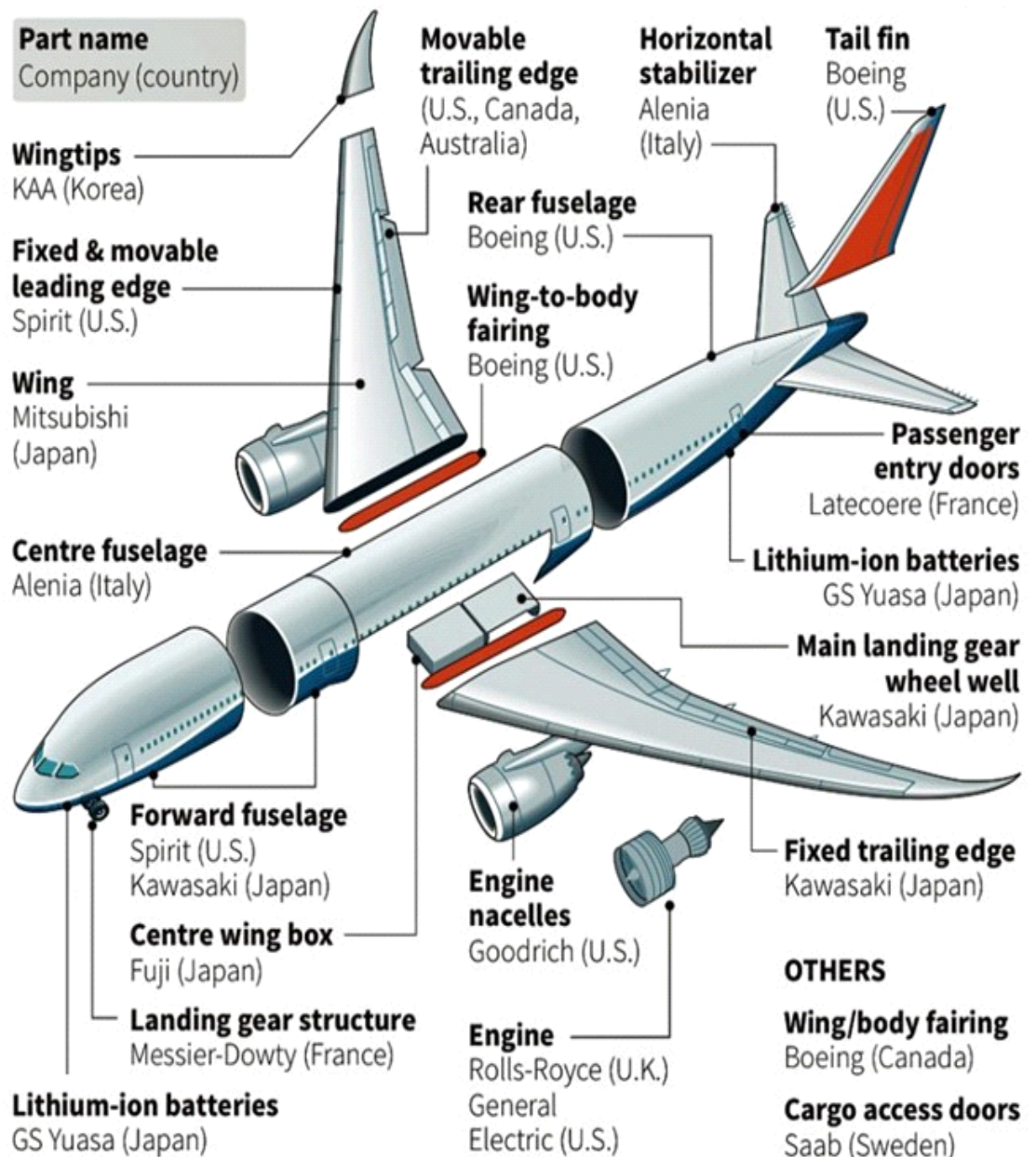
According to the **OECD** (Organisation for Economic Co-operation and Development) the concept of the global value chain can be traced back to the 1970s but became more widely recognised in the early 2000s through the recognition of key characteristics, as follows:

- The increasing fragmentation of production across countries. Global value chains link geographically dispersed activities in a single industry enabling outsourcing and other partnerships.
- The specialisation of countries in tasks and business functions rather than specific products. Most goods and an increasing number of services are “made in the world” and countries compete on economic roles within the value chain.
- Technological change in the last two decades has enabled fragmentation of production that was not possible before.
- A reduction in production and logistics costs due to increased efficiency and effectiveness. For example, progress has been made all along the logistics chain ensuring the smooth flow of goods and services in a co-ordinated and inexpensive way.
- Trade and investment liberalisation as well as regulatory reforms in key transport and infrastructure sectors.
- The emergence of Asia and the high growth rates in new emerging economies have increased the size of world demand and boosted international trade.

Not all supply chains can be described in a mechanistic or linear fashion in the way a production line takes components from one stage to the next to create a final product. Services, for example, are often tailored to very specific user needs prompting iteration in design arising from regular contact between customer and provider.

Nevertheless advanced technology, communication and logistics combined with a freer system of trade enables organisations to locate stages of production in countries where there is specialist skills and/or lower production costs. A good example is the way Boeing constructs aircraft from parts made by manufacturers across the globe.

### **Construction of Boeing aircraft**



## Organisational relationships and dependencies

The global value chain puts the focus upon business functions within the chain such as research, procurement, operations, marketing, customer services, etc. As a result countries tend to

specialise in specific business functions rather than specific industries, such as the assembly operations in China or business services in India.

This is why most organisations now have numerous relationships and dependencies with other organisations and may be involved in multiple supply chains to produce good and service or as supplier. Some of these organisational relationships and dependencies can take on formal structures and status, including:

### **Partnerships**

This is an agreement between two or more organisations to own a business together where the partners contribute money, time and expertise to make a profitable enterprise. The enterprise lasts until the partnership is dissolved.

### **Joint ventures**

A joint venture is when two or more parties agree to pool their resources for the purpose of accomplishing a specific project or business activity such as new product or service. A joint venture (JV) is usually time bound and clearly stated limits on purpose. The JV is an entity in its own right separate and apart from the participants' other business interests although each of the participants is responsible for profits, losses and costs associated with it.

### **Shared services**

This involves consolidating or centralising service operations used by multiple parts of the same organisation, which can be set up as a separate subsidiary or company. Alternatively shared services can be extended across organisations by creating a joint venture or partnership.

[Read our guide on shared services](#)

### **Outsourcing**

This is where one organisation provides service to others that are usually provided in-house. Call centre and information management are typical examples provided on a contractual basis. On-shore outsourcing refers to business operations outsourced to companies within one's own country while off-shore outsourcing refers to solutions outside one's own country.

[Read our guide on outsourced services](#)

---

## **Pressures on risk management**

These relationships and dependencies mean organisations face additional risks and uncertainties which may not be seen by taking an 'internal' perspective, but rather exist 'externally', and often only become obvious once they materialise. Increased connectivity therefore highlights the need for risk management to work across the full span of the supply chain not just within a single organisation.

This can be a challenge as we know from external quality assessments of internal audit that risk management in many organisations is still immature. In addition within extended supply chains involving partnerships, shared services, joint ventures and forms of outsourcing it may be difficult to know who can tell others what to do and who can effect instructions to mitigate risks.

A study by the [Global Supply Chain Institute at the University of Tennessee](#) published in the

summer of 2014 identified that 90% of organisations do not formally quantify risk when sourcing production. Supply chain managers in the study also said that on average just 25% of their company's end-to-end supply chain is being assessed in any way for risk. The study goes on to define some of the most significant risks, as follows:

1. Production of poor quality parts and products resulting in recall.
2. Not having sufficient inventory of finished products to meet demand due to longer time spans in the chain.
3. Natural disaster that shuts down part of the supply chain.
4. Unpredicted changes in economic conditions such as increased wage demands, taxation, currency fluctuation.
5. Unexpected transit delays.
6. Delays in the production of a new product or service.
7. Loss of customer data and intellectual property due to weaknesses in cybersecurity.
8. Political and civil unrest, including strikes that stop or delay production of good or delivery of services.
9. Loss of a key supplier which stops the flow of parts and materials beyond a reasonable time frame.
10. Failure to understand or unexpected application of regulations in a particular country.
11. Theft and/or damage of goods and materials, including piracy attacks.
12. Failed implementation of supply chain technology.
13. Siloed business processes that impact supply and demand.
14. Third-party suppliers operating outside expected values and behaviour.

An increasing number of organisations are becoming sensitive to the manner in which global suppliers do business due to high profile incidents and the wider public interest in corporate and social responsibility issues.

Customers and pressure group take more interest in and are more vocal about issues that impact people, communities and the environment. For example, on 24 April 2013, an eight-story garment factory in Bangladesh collapsed, killing over 1,000 workers. This building served several prominent retailers.

The Institute of Risk Management (IRM) explain in their document [Extended Enterprise: managing risk in complex 21<sup>st</sup> century organisations](#) the 'influencers and shapers' that boards need to pay particular attention to when thinking about risks and risk management for an extended supply chain.

### **Influencers**

**Governance** - Organisations in the extended supply chain will have different attitudes and approaches to risk management. It is important for risk management to have a profile under a broadly common approach with strong commitment from leaders.

**Information** - Access to information about risk responses is critical to understand that quality and control is up to expected standards.

**Regulation** - Different regulatory environments can make the management of risk much more complicated. Understanding the nature and scope of how regulators might influence the various participants is important.

### **Shapers**



**Incentives** - Incentives in each part of the supply chain will shape the nature and appetite for taking risks. It is important to understand what is taking place to incentivise or disincentivise people in the network.

**Ethics** - The culture and ethics underpinning the nature of what is right or wrong, acceptable and unacceptable will shape the way governance and risk management are applied.

**Assurance** - Assurance focused on significant risk to verify what should be happening is happening will shape confidence in the risk management process and influence risk mitigation.

---

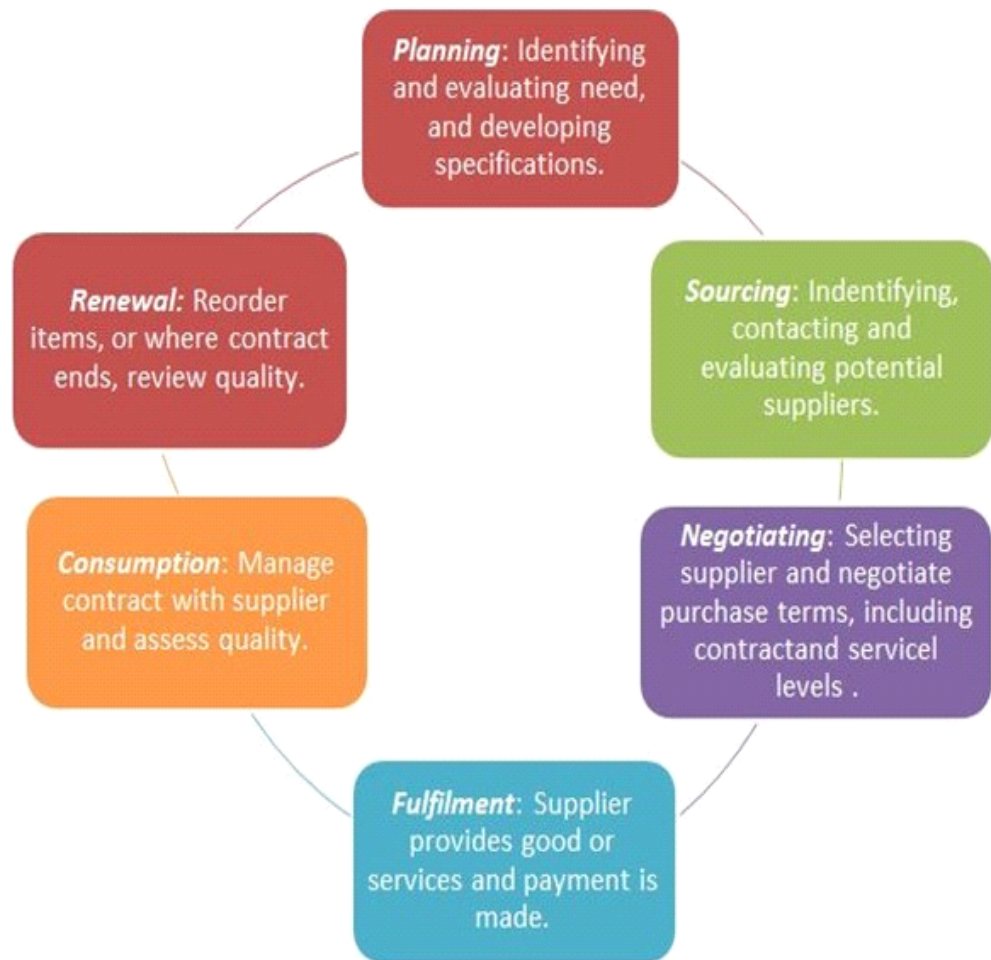
## **Internal audit's established role in the supply chain**

Risk influencers and shapers (as outlined above) can provide an indication of factors that might lead to a breakdown in the supply chain. These along with the risks highlighted earlier can form an important part of the internal audit plan.

Although the extent of internal audit's involvement will largely be determined by the nature and severity of such threats, the structure of the organisation and operating methods used. In developing a response internal audit's established role in the procurement cycle, shown below, is a good place to start.

### **The procurement cycle**





By taking a holistic view of the procurement cycle internal audit can gauge the relative importance of potential weak points and align these to specific audit engagements within the internal audit plan to provide assurance risk mitigation around significant risks is both adequate and effective.

A strategic focus to the audit universe will enable internal audit to home in on areas that are changing or have experienced issues to maximise limited resources. It also means that some parts of the procurement cycle may receive more audit attention than others according to the levels of inherent and residual risk, although this should be fully explained and justified to senior executives and the audit committee.

The procurement cycle/value chain can therefore be used as the basis for audit planning in organisations, regardless of the simplicity or complexity of the supply chain.

The listings below illustrates just some of the subjects in the supply chain where assurance needs to be considered and/or open to audit attention depending upon the severity of strategic and

operational risk and the levels of other assurances.

They can be expanded upon and tailored to the organisation's unique circumstances, including those parts of the organisation that have responsibility for managing their own procurement cycle. This of course includes those parts of the supply chain managed and operated through the external relationships we have discussed.

### **Planning**

- Defined governance for full scope of the supply chain.
- Definition of Values and expected behaviours.
- Consolidation of supply needs to enable economies.
- Expression of user needs and specifications.
- Predicted usage based on past experience.
- Recognising key dependencies and critical points in supply chain.

### **Sourcing**

- Clarity on who can make supply chains decisions.
- Application of procurement rules and regulations.
- Assessing supplier track record and/or feedback.
- Supplier selection appraisal mechanisms.
- Supplier vetting checks and references.
- Competitive tendering where necessary.

### **Negotiating**

- Contract formation and service level agreements.
- Pricing schedules with terms and conditions.
- Identification, assessment and ownership of risks.
- Quality control and complaints process.
- Defining use of sub-contracting with monitoring.
- Decision structure and process to agree changes.

### **Fulfilment**

- Ordering, logistics, and goods received process.
- Receipt of invoices with authorisation controls.
- Payment terms agreed and implemented
- Application of recognised accounting practice.
- IT and data security.
- Business continuity defined and tested.

### **Consumption**

- Application of health & safety requirements.
- Quality control measures and checks.
- Inventory and storage control.
- Relationship management.
- Exception reporting and user feedback.
- Obtaining and responding to customer feedback.

## Renewal

- Supplier assessment procedures.
- Budgetary control and usage monitoring.
- Risk register updates for emerging risks.
- Balanced scorecard and KPI monitoring.
- Specifications reassessment and update.
- Learning from issues and incidents.

Deciding what to audit, when and where requires discussion with senior executives, procurement professionals and risk managers, as well as consideration of other sources of assurance.

In particular internal audit should discuss the extent of assurance with operational managers (the first line of defence) and other assurance providers (second lines of defence). By coordinating activities it is possible to maximise the overall use of limited audit resources to avoid duplication and/or gaps.

For instance it may be a better use of internal audit's time (as the third line of defence) to consider and support the assurance work of others rather than directly auditing the same risk areas.

One example might be to initially examine the reliability that can be placed upon management's supplier vetting and assessment processes followed by some 'lighter touch' internal audit work to verify established risk mitigation and risk appetite levels remain effective.

However, the scale of this task should not be underestimated as it is likely there will be a variety of assurance providers adding support costs to the supply chain by undertaking reviews at various points. This can include ISO accreditations for quality, environment, health & safety and IS security as well as the work of compliance, customer services, human resources, legal & regulatory, risk management etc.

While assurance is important there is a need to minimise cost and to avoid business units being overburdened with 'audit'. Consequently internal audit is well positioned to present a case for mapping and coordinating assurance (a requirement of [Standard 2050](#)) against significant supply chain risks.

In the absence of a formal mechanism internal audit could initiate a coordinated approach through regular discussion with and review of other assurance providers.

---

## The extended supply chain and challenges for internal audit

Internal audit's established role in relation to supply chains remains valid but internal auditors in every organisation must now face up to the challenges of increased complexity. It's not a question of whether complexity exists it's about helping the organisation to understand just how complicated it is, to understand whether risks are being identified and to prioritise assurance where it is most needed.

The Chief Executive of the Institute in the UK & Ireland, Dr Ian Peters underlined the importance of this subject in May 2013 when he said in his blog "If effective supply chains are increasingly a key element of competitive advantage, then internal audit teams highly engaged in this aspect of the

business are also critical to an organisation's competitive edge.”

Understanding how the supply chain works is therefore crucial. Management need to have a full picture of the process, sub-processes and the myriad of relationships and dependencies that exist before it can truly identify and assess the nature of the risks involved. There are many modelling tools available that will support the mapping of the supply chain but choosing the right tool with the right level of detail to understand what makes the supply chain work will require considerable expertise.

The bottom line is, however, that those who have responsibility for managing the supply chain and the dependencies that support it should have a good understanding of how it works and where the potential weak points are and should therefore consider use of such tools.

Where mapping does not exist internal auditors can raise the issue and highlight the vulnerabilities and threats of not having clarity of the supply chain and visibility of the risks. Where mapping does exist internal audit can provide assurance that it is current and accurate.

Assurance upon the application of risk management, accuracy of risk reporting and the effectiveness of risk mitigation within the supply chain is a related but separate issue that presents a particular challenge for organisations with complex supply chains.

Where the organisation relies upon third-parties, (partners, joint ventures, shared services and outsourced services) and most now do, responsibilities regarding how risks are to be identified, assessed and managed also requires clarity. It may be the case that the organisation is itself a provider of products and services adding further complexity to risk management.

According to Bill Schneider, Director of Accounting at AT&T, the new COSO ([Committee of Sponsoring Organisations of the Treadway Commission](#)) framework and the U.S. Sarbanes-Oxley Act stipulate management is responsible not only for internal controls designed and operated by staff, but also for those outsourced to service providers and by extension internal auditors need to:

- Understand and monitor where third-party service providers interact with the system of internal control.
- Ensure third party service-level and other agreements set appropriate expectations about how those entities will perform relative to the control environment.
- Monitor how the third parties are performing and verify activities third parties are undertaking to make sure controls are operating effectively.

Internal audit can therefore provide assurance upon whether roles and responsibilities for risk management are clear and fully defined, that managers are applying risk management where there is an expectation to do and that reports on risk are meaningful. This should include the capture of emerging risks and the re-assessment of risks when incidents occur.

In doing so internal audit should have a discussion with the audit committee and senior management upon whether internal audit is expected to provide assurance upon the effectiveness of risk management applied by third-parties. If this is the case an agreement between the organisation and third parties will probably be needed to enable internal audit to carry out this function.

This raises a question for the profession as a whole about the way internal auditors from different organisations in complex supply chains should work together to provide assurance. Without a meaningful debate that leads to a constructive and collaborative solution it is difficult to image how

risk management and assurance can be delivered in a cost effective way.

Where risk management is less mature across the supply chain internal audit is in a position to provide advice and insights through its consultancy role to help build or develop risk management processes. This role can take several focuses such as: advocating the value of risk management, facilitating risk identification, assessment and control, fostering thinking about risk appetite levels, assurance mapping etc. Internal audit consultancy can also be applied specifically to the supply chain either through named audits or as part of every audit review.

For example in parts of the public sector such as health, local government and central government where there is an expectation that internal audit will perform value for money evaluations to enable economies, efficiency and effectiveness. The National Audit Office 2013 guide [Getting value for money from procurement](#) provides useful advice on this subject, although it is primarily focused upon procurement rather than the wider issues and risk associated with complex supply chains.

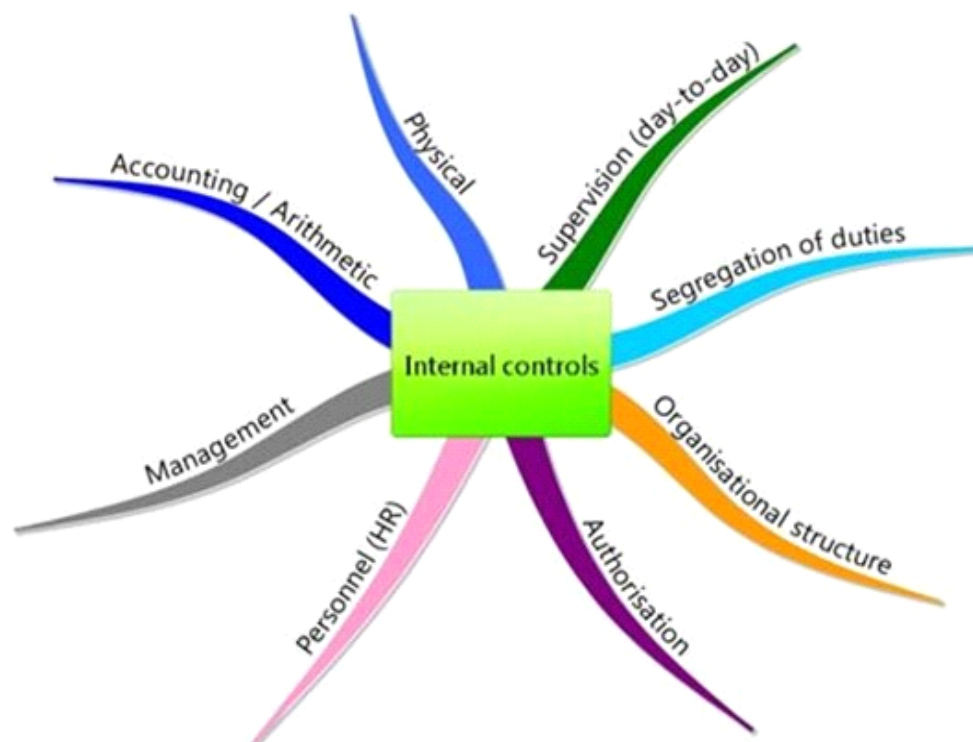
In the course of looking at emerging risks there is also a need for internal auditors to consider whether adequate risk tolerance levels have been set that are clear and simple so that members of the extended supply chain work can adhere to them.

As we have explained in our [guidance on risk appetite](#) it is important to ensure risk tolerances, as set out in risk appetite statements, are achievable and meet stakeholder expectations, including those of regulators. This in itself may prove difficult given that various parties within the supply chain may have different appetites for risk. This means risk appetite statements need not be developed purely from the top down in a joint way and with the agreement of third parties.

It is important to understand and factor in how different parts of the extended supply chain already apply boundaries or limits that will enable risk appetite statements to be achievable.

Finally, internal audit can provide advice and assurance around the key controls within the wider supply chain network. This may also include reviewing the design and testing of contingency arrangements should there be a failure at a critical point in the wider chain.

In this regard internal auditors from the different organisations involved should work together to consider the overall adequacy of controls, their ownership and how control performance will be monitored and reported. This includes consideration of the mix of controls;-preventative, directive, detective and corrective, as shown in the diagram below.



---

## Conclusion

While the benefits of extended supply chains provide new and interesting opportunities for organisations they present challenges in terms of governance, risk management and control. There are no easy and readily identifiable answers, ongoing discussion is required by between all parties; board members, non-executives, professional procurement managers, risks managers and internal auditors.

At present it is still uncommon for internal auditors from different organisations to work together but there is a growing need for this to happen and for internal auditors to be more outward looking. That said there are clearly points to manage around confidentiality and if and how information can be shared.

Rather than concentrating solely on what is happening inside the organisation there is a need to extend the boundaries of the audit universe to incorporate assurance related to **business partnerships**, either as the provider or recipient of goods and services.

Internal auditors have a key role to help boards and their audit committee understand the complexities of their supply chains and the importance of robust assurances to manage these (by management and second line functions), in order to prompt greater understanding of the critical points/risks and provide assurance that risk management and risk mitigation are adequate and effective. The challenge for internal auditors everywhere is to recognise the value this can offer and

to make it happen.

---

## **Further reading**

[Outsourced services](#)  
[Shared services](#)