



UNDERSTANDING SUPPLY CHAIN RISK AREAS, SOLUTIONS, AND PLANS

A FIVE-PART SERIES

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Independent Risk Consulting

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Business Risk

Technology Risk

Internal Audit

Introduction

The purpose of this paper is to interpret and discuss the results of the recent supply chain risk survey carried out by APICS and Protiviti. The document is intended to help business leaders to better understand these results and use this information as part of their overall information pool when evaluating and managing supply chain risks and opportunities.

Supply chain management incorporates a wide range of very significant and inherent risks and opportunities. These risks and opportunities apply to activities within the company's organization as well as outside the organization at suppliers, at the suppliers' suppliers, and outward at the organization's customers and customers' customers. In other words, these risks and opportunities can affect the entire chain. For most organizations, it is clear that supply chain management processes can greatly influence the organization's performance and the predictability of that performance.

For some industries, supply chain performance can be a real competitive differentiator. For others, successfully managing supply chain and its inherent risks has become a prerequisite for success or even survival. At the mention of supply chain management, consumer products, retail, energy, construction, and manufacturing are among the industries that spring to mind. However, supply chain processes affect all industries in some form or fashion. For example, procurement processes contain many major risks and opportunities in supplier management, product and services sourcing and outsourcing, contract management and control, purchasing execution and control and so on. These risks exist at all kinds of organizations and in every type of industry.

In today's risk-sensitive world, companies can become preoccupied with risks such as international terrorism and homeland security, natural disasters, SARS, and the like. But supply chain risks are many and are often considerably more mundane and controllable than some of these high-profile scenarios. These areas of risk include

- A variety of supply interruption risks
- Purchase price risks
- Regulatory and compliance risks
- Customer satisfaction and service risks
- Process inefficiency risks
- Product introduction and cycle time risks
- Project management risks
- Information integrity and availability risks
- Demand and supply planning and integration risks
- Inventory and obsolescence risks
- Information privacy and security risks
- Contract compliance and legal risks
- Employee and third-party fraud risks
- Human resource skills and qualifications risks
- Corporate culture and change management risks

Organizations of all sizes have recognized the need to put strategies and capabilities in place to identify, prioritize, and manage risks and opportunities across their entire supply chains and within and across their internal supply chain processes.

Executive Summary

Against a background of both controllable and less-controllable risk, APICS and Protiviti Inc. developed a supply chain risk survey. The objective was to solicit the opinions of APICS members and other professionals about

- 1) The top supply chain and procurement risks facing organizations
- 2) The top supply chain and procurement solutions available to manage the universe of supply chain risks and
- 3) How organizations are actually prioritizing investments for solutions to manage supply chain risks today.

Nearly 500 respondents provided opinions. We have analyzed and interpreted the results. The results have been augmented with our own knowledge of developments in supply chain risk management and control as well as other related surveys. This paper is organized to address the survey results from each of the three areas in question and to provide essential links across the various areas in question.

There are interesting similarities and differences among the priority of the risks identified in comparison to the most popular solutions, and solutions which are at some stage of implementation at this time. Whereas some areas of risk are clearly on the rise in terms of perceived importance and impact for organizations, many of the traditional and high-impact areas of concern continue to be at the top of many respondents' agendas.

We trust you will find this paper to be of use to your organization as you focus on strategies for supply chain risk identification, quantification, prioritization, mitigation, monitoring, and control.

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Let's begin by looking at a high-level summary of results for each of the three areas in question.

Question 1: What supply chain/procurement risks or concerns are most likely to negatively impact your organization?

The results identify what respondents believed to be the most serious supply chain-related *risks threatening* their organizations.

The top three supply chain procurement risks that are most likely to negatively affect organizations are

- 1) Supply interruption risk
- 2) Lack of an effective senior executive-led sales and operations planning (S&OP) process
- 3) Lack of timely and accurate information and spend analysis capability for strategic sourcing

Question 2: In your opinion, which of the following supply chain/procurement solutions would have the greatest impact in minimizing risk to your organization?

The second question was intended to help us understand what respondents felt were the most effective risk management strategies, solutions, or *capabilities available* to address the universe of supply chain-related risks facing organizations.

The top three supply chain/procurement solutions that would have the greatest impact in minimizing risk to organizations are

- 1) An integrated and supported supply chain and/or procurement strategic plan
- 2) A formal and effective enterprisewide supply chain risk management process
- 3) An effective corporatwide strategic sourcing process

Question 3: Which of the following solutions, if any, are currently key business priorities within your organization?

The third question focused on what was actually going on within organizations today (in progress or planned) to address and mitigate supply chain-related risks. Key business priority means the process has been started or will begin within the next 12 months. This question was intended to help us understand where organizations were investing resources today or would be in the near future in order to improve supply chain risk assessment, prioritization, and mitigation.

The top three key supply chain solutions priorities are

- 1) An integrated and supported supply chain and/or procurement strategic plan
- 2) An effective corporatewide strategic sourcing process
- 3) Effective supplier management and contracts management and control capabilities

Observations and Considerations

Combining the data from answers to questions 1 and 2 provided some interesting and useful insights into supply chain risks and preferred mitigation solutions.

Sixty-six percent of respondents thought that supply interruption was either the first or second most significant risk. Given the multitude of opportunities for supply to be interrupted, from basic issues of supplier performance failure to high-profile acts of terrorism, it is no real surprise that supply interruption is uppermost in the minds of so many respondents. The application of a formal enterprise-wide supply chain risk management process scored second among the highest-impact solutions.

Supply interruption risk mitigation occurs in a) an effective corporatewide strategic sourcing process and b) the implementation of effective supplier management and contracts management and control capabilities. These two risk management and control options also scored high in the preferred solutions section of the survey; they rated a *joint-third* as the choice for greatest impact solutions for minimizing risk.

The lack of an effective senior executive-led S&OP process was identified as the first or second most significant risk for 55 percent of respondents. This was probably a somewhat less predictable outcome. We find it encouraging that there is such a high level of awareness across industries that S&OP is a highly important risk management and control process when implemented effectively.

The high ranking for S&OP by respondents emphasizes the importance of effective executive-level leadership, cross-functional teamwork, and shared risk management across all key aspects of resource management and demand and supply planning.

Whereas a high number of respondents saw the implementation of an integrated senior executive-led S&OP process as a primary preferred solution (60 percent), an even higher percentage (66 percent) saw the need for an integrated and supported supply chain and/or procurement strategic plan as the top priority. These two (supply chain strategy and S&OP) are closely related. Absence of an integrated supply chain or procurement strategic plan was considered to be a very significant risk by 45 percent of respondents.

To no real surprise, 49 percent of the respondents identified the lack of timely and accurate information and spend analysis capability for strategic sourcing as a key risk area. Several other important studies in the past two years have documented this as a major area of risk for companies that want and need to leverage and control expenditures and manage risks with suppliers of goods and services. One such study described this risk area as a “corporate epidemic” (Aberdeen Group and Penton Media, January 2003).

A slightly lower, but still very significant number (44 percent), saw the provision of spend aggregation and spend analysis tools as a priority preferred solution. Sixty-two percent highlighted the importance of an effective corporatewide strategic sourcing process as a top priority. This is also consistent with a number of other recent surveys. Somewhat surprisingly, risks associated with not leveraging total expenditures with third parties scored a good deal lower in this section of the survey (just 29 percent).

Only 20 percent of respondents saw the implementation of an effective supply chain management program to mitigate Sarbanes-Oxley Act risks as a very high priority. Additionally, risk associated with noncompliance with the Sarbanes-Oxley Act scored low among those rating the risk as most likely to have a negative impact (16 percent).

The solution-investment areas that ranked 1 through 4 produced a narrow range in the voting—50 percent, 49 percent, 47 percent, and 43 percent. This can be interpreted any number of ways. However, we see it as companies understanding there is a fairly wide range of valuable and viable solutions to help them manage supply chain risks. So, no one or two solutions will fully meet their needs or dominate the voting and investment.

What did surprise us somewhat is that as many as 50 percent of the respondents voted an integrated and supported supply chain and/or procurement strategic plan as one of their top two priorities at this time. We see strategic planning as a foundational supply chain risk management capability and are encouraged by this response. Unless the organization knows where it is going and has aligned plans as to how and when it is going to get there, it is unlikely to succeed. However, with as many as 66 percent choosing strategic planning as a high-impact solution in question 2 of the survey, there is a sizable gap between those recognizing this as a critical solution and those who are currently doing something about it.

Scoring 49 percent was an effective corporatewide strategic sourcing process. There was no surprise with this result. Strategic sourcing is an excellent example of proactive risk management, and its success is dependent on the presence of effective policies to support the overall business strategy to use the strategic sourcing methodology; a culture, organization, and skills to effectively implement the process; timely, accurate, and complete information for decision making; and measurement and control of the process and the tools and raw data to ensure the information is timely, useful, and accurate. Just 35 percent were focused on providing the tools and information required for effective and efficient strategic sourcing.

Effective supplier and contracts management and control capabilities rated 47 percent in first- and second-place votes for solutions being implemented by the organizations represented by the respondents. Whereas strategic sourcing is an excellent proactive risk management process for procurement, supplier and contracts management have both a proactive risk management component as well as critical monitoring and control components. Therefore, it is clear that these processes and controls are being implemented parallel with and as enablers for strategic sourcing.

Forty-three percent saw the implementation of an integrated senior executive-led S&OP process as a key business priority. Given that the lack of an effective process rated the second-most number of votes in the risk portion of the survey, it is important that there is a good deal of activity and investment in this area. However, our own assessments and audits of S&OP processes within companies exhibit a great deal of risk in the design, implementation, and maintenance of the process. If there are weaknesses in any of these three phases of the process, the likelihood of failure or disappointment is very high.

Whereas 63 percent of the respondents saw a formal and effective enterprisewide supply chain risk management process as a very high-impact solution to manage risks (such as supply interruption and others), only 36 percent mentioned such a process/solution as a key priority for the organization. This ought to be a concern for many. The enterprisewide supply chain risk management process would incorporate and leverage traditional and evolving risk management practices and solutions to address and prioritize the universe of risks facing management.

Finally, an effective supply chain management program to mitigate Sarbanes-Oxley Act risks rated just 17 percent of votes as a top priority solution and reflects the same set of possibilities and concerns that we noted in the highest risks and highest impact solutions summary.

Approach to Analyzing and Presenting the Findings

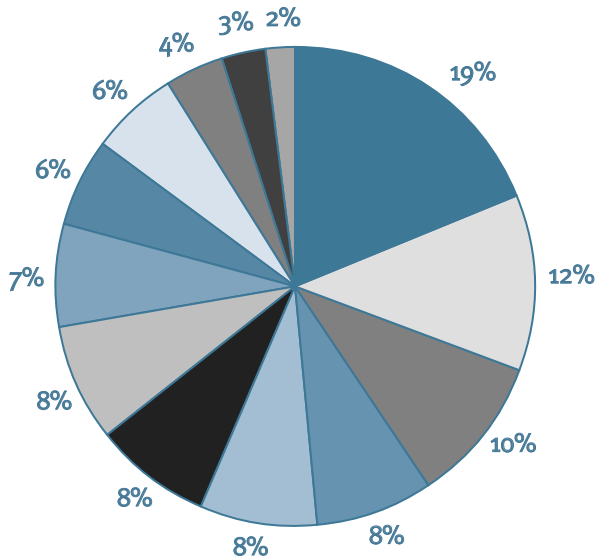
In reviewing the data, we decided that it would be most effective to focus on the risk areas in question 1 and to discuss these in some depth while continuously referencing the highest-impact solutions and current solution priorities covered in questions 2 and 3.

We further consolidated the risks into five categories. This enabled us to aggregate the pure procurement-related risks from three topic areas down to one (procurement risk management). Therefore, risk areas will be organized and discussed as follows

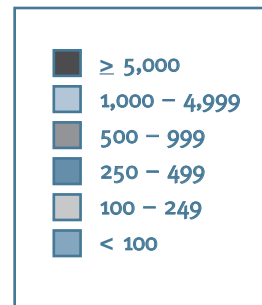
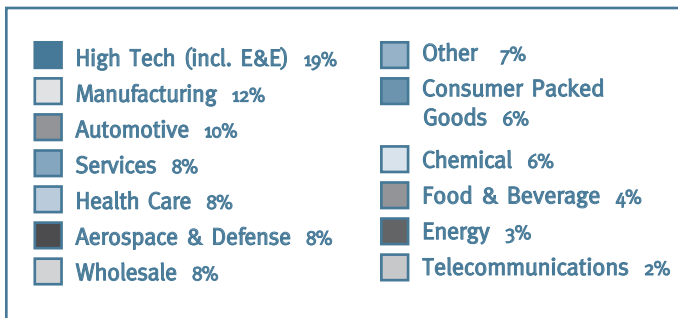
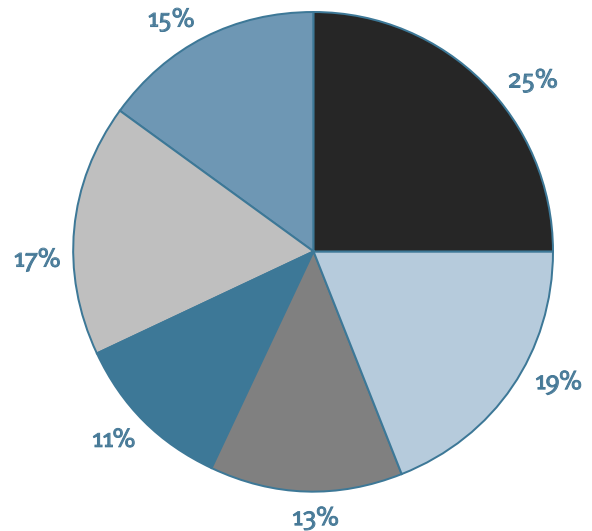
- 1) Supply Chain/Procurement Strategic Planning
- 2) Sales and Operations Planning
- 3) Procurement Risk Management - Strategic Sourcing and Leverage, Supplier and Contracts Management, Sourcing Information and Data
- 4) Supply Interruption
- 5) Sarbanes-Oxley Act Compliance and Controls

Survey Demographics

Respondents by Industry (%)



Respondents by Company Size (# of Employees)



Risk Area #1

Supply Chain and/or Procurement Strategic Planning

This topic area was rated high (most likely to negatively affect the organization) by 45 percent of respondents while 66 percent of the respondents saw it as the solution with the potential to have the greatest impact in terms of minimizing risk for the organization (highest rated solution of all). Supply chain and/or procurement strategic planning was also the highest ranked current priority (50 percent) for respondents by a small margin. The risk element was somewhat less of an issue with chemical and other industries. Similarly, the risk was rated as less of a concern for mid- to large-sized companies.

To manage supply chain risks and opportunities and to achieve supply chain and procurement optimization, a company needs to define its strategic plan, including the vision, mission goals, objectives, and plans for developing supply chain and procurement capabilities. These plans should align with and enable the overall business strategy and model. Achieving this requires the creation of an overall strategy that will bring the company's supply chain and procurement activities and capabilities into alignment with the business model—most important to align with are customer service goals, channel strategies, profit and market share objectives, operational performance goals, and management/organization structures and culture.

All supply and procurement capabilities must be targeted within the strategic plans to achieve the desired performance levels so as to position supply chain and procurement infrastructures that can support those desired levels of cost performance and revenue enhancement.

Capabilities addressed in the strategic plan should include supply chain and procurement policies; all core supply chain and supply chain risk management processes; organizational capabilities including skills, competencies, and cross-functional teamwork; information for decision making (management, measurement, and control); and the supporting systems, tools, and data standards required to produce the information for decision making in a timely, accurate, and complete fashion. See example of capabilities and interdependencies on page 9.

Enterprisewide supply chain and procurement risk management can be fully integrated with and contained within the overall supply chain strategic planning process and plans, and should address risks in all aspects of supply chain and procurement capability.

Let's return to the data again. The survey showed that supply chain/procurement strategic planning was seen as a greater risk by small to medium-sized companies. On further investigation of the data, it became evident that this risk rating was probably because more of the mid- to large-sized organizations already had strategic plans in place or at least planned to address this key risk area.

Individual managers and organizations tend to prioritize risks by focusing on those where they may be less confident in terms of current mitigation plans and controls. This can distort the results. It is prudent to assess risk first without insight into current controls. When risk mitigation and control are reviewed in the risk management process, risks for which there are good controls will not demand the same level of management attention and investment. On the other hand, risks that may rate lower in terms of significance and/or impact, but for which mitigation plans and controls are less concrete, will demand higher investment and effort.

Supply Chain and Procurement Strategic Planning – Role in Risk Management

Supply chain and procurement strategic plans should drive clear vision, objectives, and actions to supply chain risk management within the overall strategies and plans. Required policy, process/subprocess, and organizational capabilities, along with information for decision making and systems and data capabilities, should be designed with a view toward proactive and built-in risk assessment, management, monitoring, and control.

Many best practices in supply chain management and procurement are also best practices in risk management and control. Among those practices are

- Supply chain and procurement strategic planning
- Policy development (aligned with those strategic plans)
- Process and procedure development and alignment with policy
- Strategic sourcing
- Contracts management and control
- Supplier management and control
- Sales planning and forecasting
- Sales and operations planning (S&OP)
- Inventory management and inventory control
- Master scheduling and shop floor control
- Distribution planning and control
- Supply interruption risk assessment and contingency planning
- Cross-functional teamwork
- JIT and total quality control
- New product planning and lifecycle management and control
- Transaction quality control

The Supply Chain and Procurement Strategic Planning Process

The following is an example of a progressive strategic planning process that can be used effectively for supply chain and procurement. This model is adapted from a progressive model presented by James F. Kimpel, CFPIM, CIRM, at the APICS International Conference and Exposition held in Orlando, Florida, in October 2000. Since that time Protiviti has road-tested such planning models within its own business and with clients.



The model includes “Environmental Scan and Industry Competitive Analysis” activity. Internal analyses and documentation together with external sources of information and research are leveraged in this phase. Small group meetings and individual interviews with executives and professionals from across the organization are conducted to develop further information for setting key objectives and for a comprehensive risks, opportunities, strengths, and weaknesses (ROWS) analysis.

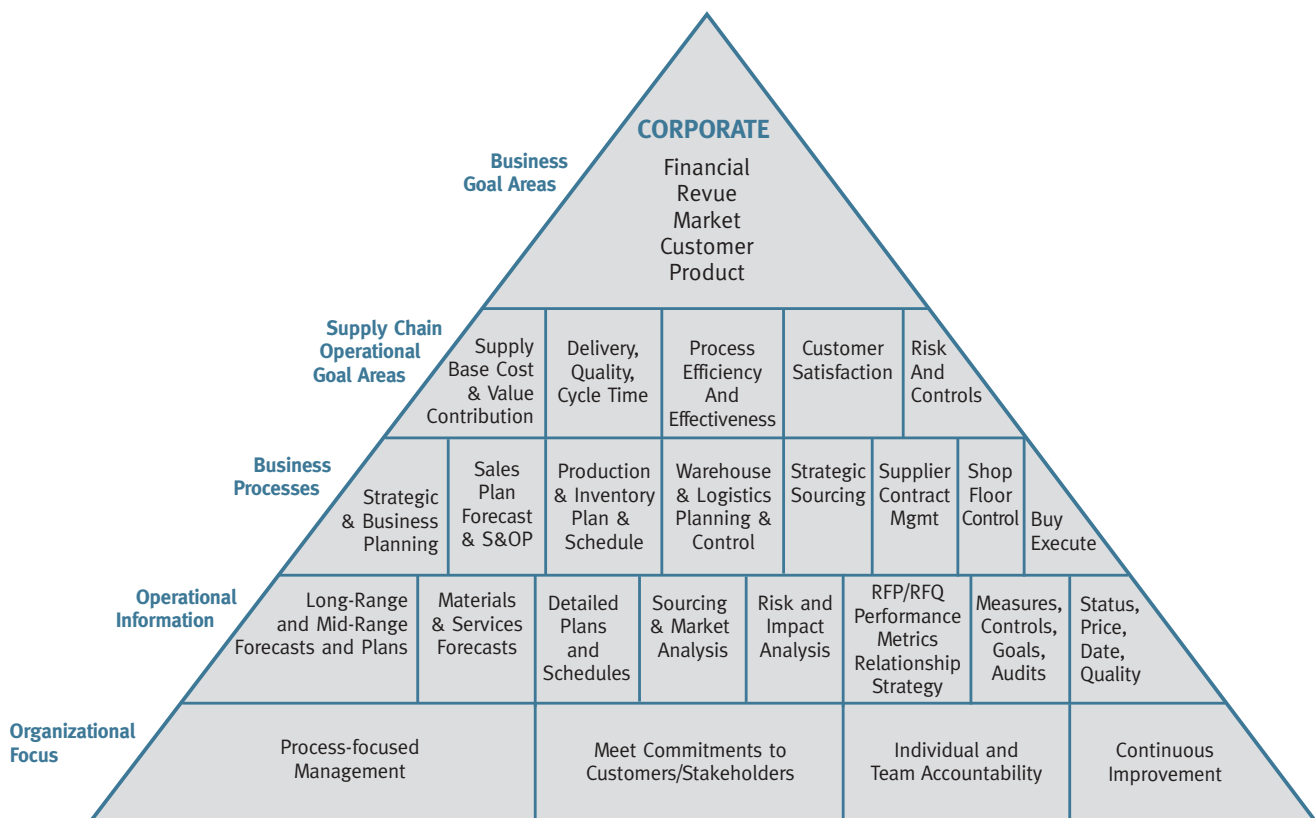
Supply chain/procurement strategic plans should cover a 3-to-5-year horizon. The plans should include clear vision, objectives, and plans for each critical supply chain and procurement process and subprocess. Each process area should incorporate risk management and control characteristics. The strategic plan should also address plans for all aspects of supply chain/procurement organization and skills capability.

The plans need to address information requirements for management, measurement, and control of the processes and risks along with short-, mid-, and long-term plans to identify and provide the systems and data required to meet the supply chain and procurement information for decision making; organization; and people, process, and other strategic needs of the company.

Below is one example of a strategic planning platform. It may be helpful as we think through how risk management and control can be incorporated in the strategic planning process.

This particular model is intended as an *example* for discussion purposes only.

Example: Supply Chain Management/Procurement Strategic Plan Platforms

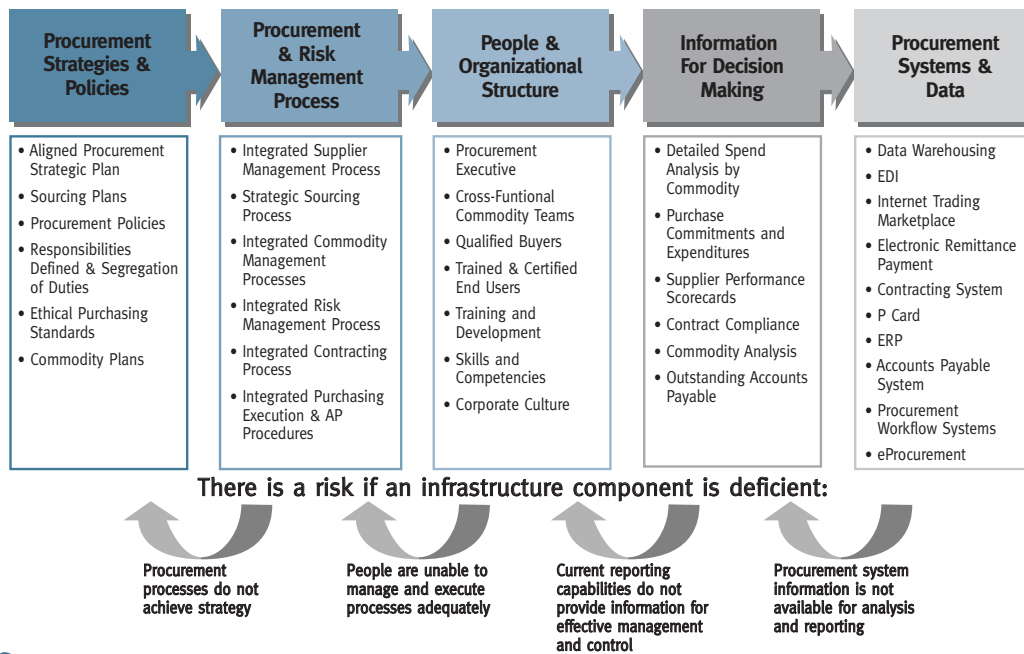


Note: An effective supply chain strategic plan should align customer and product/service strategies with well-structured supply operations through defined channels and customer-focused operations. All supply chain, procurement, and operational activities must be tightly aligned with this business model. Risk management is both explicit and implicit in the strategies, and processes, and in the information, systems, and data capabilities of the business.

Supply Chain and Procurement Components of Capability – Interdependencies

We have discussed the need to address all key components of capability when developing a supply chain and/or procurement strategic plan. The interdependencies among these capabilities are very important in the strategic planning process. Experience shows that the plan will only be as good as the weakest component of capability.

Below is a visual that helps to depict those interrelationships across the components. The *example* used below addresses capabilities and interdependencies when developing procurement strategic plans. The concept is equally relevant when designing overall supply chain process strategic plans and for the creation of all other supply chain subprocess strategic plans (produce, plan, store, transport, sell, and so on).



Conclusions

Supply chain and procurement strategic planning is recognized in the survey as a key risk area and as a critical risk mitigation practice. Strategic planning is also seen as a high priority current risk solution or investment area. Following are some key points to note about supply chain and procurement strategic planning as a risk management solution.

- 1) Strategic plans should be developed using a robust, disciplined, and continuous planning process. Alignment with overall business strategy is essential.
- 2) Supply chain and procurement strategic plans need to address all components of supply chain/procurement capability including a) policy; b) process, subprocess, and procedures; c) organization and skills; d) information for decision making (management, measurement, and control); and e) systems and data.
- 3) Strategic objectives, vision, and plans should typically span a 3-to-5-year horizon and be updated annually (at least).
- 4) Key performance indicators (KPIs) for the supply chain process should be included in the strategic plan and align with overall business KPIs.
- 5) Risk management practices need to be addressed both implicitly and explicitly in the processes and controls set out in strategic plans.
- 6) Many recognized supply chain and procurement best practices and controls are also valuable and viable risk management practices and controls.
- 7) Enterprisewide supply chain and procurement risk management can and should be fully integrated with and contained within the overall supply chain strategic plans, addressing all aspects of supply chain and procurement capability.

Risk Area #2

Sales and Operations Planning (S&OP)

Sales and operations planning (S&OP) is a means by which senior management can orchestrate and execute business strategies and plans; prioritize plans and choices; evaluate and prioritize risks; set risk tolerances; and manage, monitor, and control demand and supply plan performance and variances. It is an effective means for senior management to demonstrate leadership and teamwork and practice shared risk management while keeping a firm handle on the business.

As previously noted, 55 percent of the respondents believed that the lack of an effective senior executive-led sales and operations planning (S&OP) process, was the first or second most significant risk, while 60 percent saw S&OP as a highest-impact solution. However, just 43 percent are currently treating S&OP as a high-priority solution/investment. This may be cause for concern. S&OP is a high-impact senior executive decision-making process and may still be an underinvested area of risk management for a large number of organizations.

The industry portion of the data is also worth highlighting. For example, the S&OP risk itself was rated as highest by a range from 52 percent (automotive) to 61 percent (wholesale) of respondents. Only one industry rated the risk well outside of this range, aerospace and defense, at just 39 percent. That industry reported a 39 percent rating for S&OP as a current priority. But 53 percent of the respondents stated that S&OP was a high-impact solution for the industry. This requires further investigation beyond the data in this report.

There was significant disparity in perception of both risk impact, 50 percent, and solution impact, 55 percent, in the chemical industry respondents when compared with current investment/priority of just 27 percent. This too may be cause for concern. However, it is worth pointing out that the chemical industry rated all current solution investment/priorities no higher than 27 percent and as low as 9 percent. As a rule, the chemical industry generally rated high-impact risks in question 1 and high-impact solutions in question 2 lower than other industries. But the disparity in question 3 stands out and may deserve a further study within that industry.

We included this question because we felt that S&OP might be a key risk area for organizations. But we were still somewhat surprised by the degree of agreement exposed by the results. The strategic importance to business and supply chain performance of executive-led, highly disciplined demand/supply planning and S&OP practices has been at the heart of the APICS educational programs for many years.

Additionally, there was less evidence of major disparities in results when they were viewed in light of the number of employees in the organization. From a risk perspective, all organizations voted S&OP as a highest risk in the range of 51 percent to 60 percent. Small to mid-sized organizations positioned S&OP as a highest impact solution in the 63 percent to 70 percent range, while mid-sized and large organizations did so in the 53 percent to 57 percent range. Only the largest companies rated S&OP as a current high priority for close to 50 percent of respondents, with S&OP being a current priority for between 35 percent and 40 percent for all others.

Sales and operations planning – Why Is It Such a High-risk Area for Companies?

Poor planning and scheduling destroy the effectiveness and efficiency of an organization. On the other hand, effective demand and supply planning and execution are essential ingredients within a high-performing supply chain process. Success in demand/supply management requires a high degree of cross-functional leadership and collaboration among organization executives, managers, and professionals. It also relies on streamlined and integrated demand and new product and supply planning processes. It also requires timely, accurate, and complete flows of information.

Furthermore, effective resource planning is required *throughout the supply chain*, with a strong emphasis on information timeliness and integrity; comprehensive and integrated risk assessment; agreement by management as to acceptable risk tolerances; and continuous monitoring, control, and mitigation of those goals and risks. It is no longer acceptable to focus only on internal resources. All key sources of materials and services need to be addressed in S&OP to ensure that all critical internal and external resources and capacities are in alignment to meet the demand plans of the organization.

Demand and supply management require persistent and continuous evaluation of cross-functional operational goals, risks, metrics,

controls, and performance at all levels of the organization. Senior management must own and drive the process and resulting decisions. Becoming an agile and efficient organization is no longer considered merely a strategic advantage for many organizations. Today it is a requirement, a prerequisite, to surviving in a highly competitive environment.

It is evident from the responses in this survey that many of the respondents have had up close and personal experience with S&OP risks and the resulting negative impact. These risks are manifested in some or all of the following ways.

- Lack of teamwork, shared risk management, and accountability among internal functions
- Lack of true integration among business partners—internal and external—in the value chain
- Unacceptable levels of forecast error and lack of ownership of sales plans and forecasts
- Ineffective bottleneck and constraints management
- Material/product shortages and increased expediting and freight costs
- Supply interruption—leading to production delays and on-time delivery issues with customers
- Longer than necessary lead times
- Excessive on-hand inventories and obsolescence and lower inventory turns
- Reduced confidence in planning systems; working around the system is common
- Poor utilization of resources and lack of resources when needed

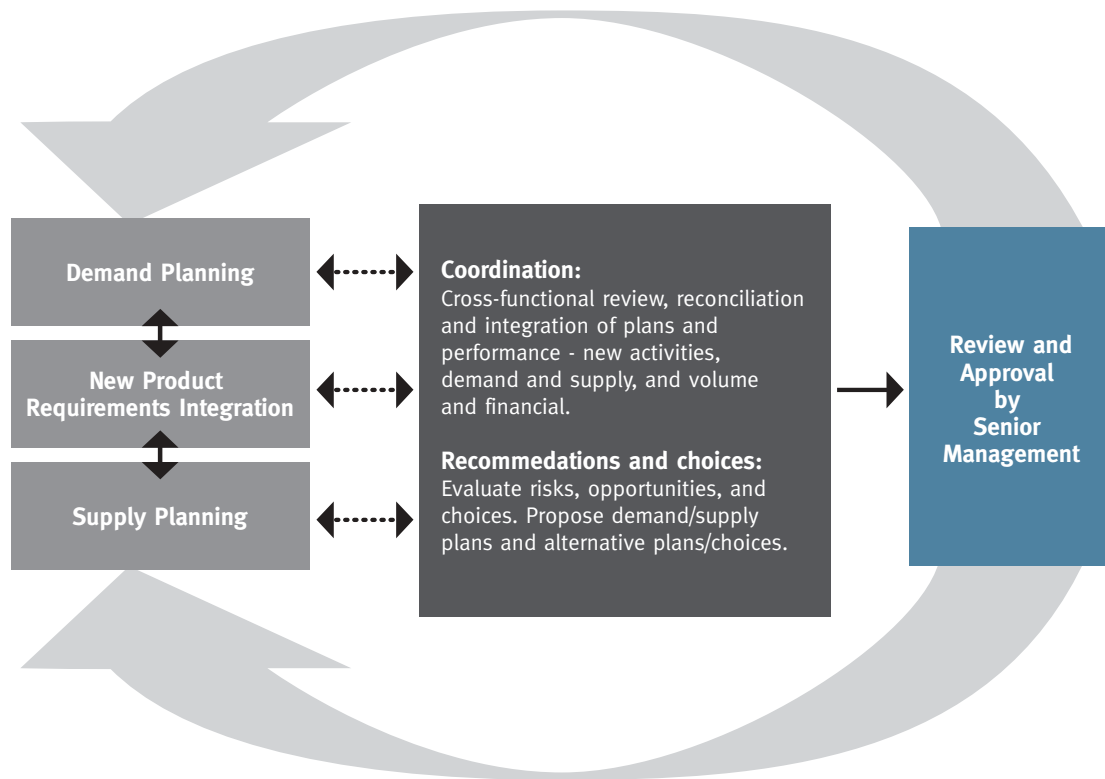
When management recognizes these risks and results and develops integrated strategies and implementation plans to install an effective S&OP process, the following benefits are typical.

- Improved predictability on customer deliveries
- Improved flexibility to respond to mix changes because the volume picture is under control
- Improved lead times and complete order fulfillment
- Opportunity to increase market share through improved service
- Inventory optimization, reduced obsolescence, and improved availability of inventories
- Volume changes made sooner and smaller and therefore more economically
- Reduced production delays and expediting costs
- Reduced materials buffer levels along the supply chain leading to increased working capital
- More stable production rates and improved capacity utilization and performance predictability
- Senior management decisions are integrated and are directly reflected in the detailed plans for the business (senior management running the business by the numbers)
- Foundation to Class A performance; relying upon both system and process integrity
- Ability to reduce forecast error for sales and operations planning
- Increased organizational integration, shared risk management, and accountability

A key foundation for the supply chain *process*, and for the S&OP, is an effective and accountable *sales planning and forecasting* process. This persistent risk-area topic deserves an entire white paper in its own right. Whereas sales planning and forecasting must be the responsibility of sales and/or marketing functions, S&OP must be fully integrated with new product plans and supply plans. The process must reward efforts to produce the best possible plans, focus on eliminating risks associated with forecast bias, and produce a commitment to continuous forecast error measurement and improvement.

Sales, marketing, finance, new product management, supply, and operations must work closely to reconcile plans, identify risks and scenarios, and present recommendations and choices to senior management. Led by the senior executive, the S&OP management team must review performance metrics, discuss recommended plans (12-18 month rolling), discuss risks and choices, and make decisions and commitments. Policy and process must dictate that these decisions be translated into specific actions and schedules by the organization. The organization then monitors and controls performance on an hourly, daily, and weekly basis, depending on the industry, lead times, criticality of the material, and other factors.

Sales and Operations Planning and Subprocesses



S&OP requires an overall vision; strategy; policy; defined planning process; teamwork; accountability; preparation; quality and timely information; executive decision making; reporting and analysis tools; accurate, timely, and complete data.

The chart above describes the subprocesses in scope when we discuss S&OP and S&OP-related risks. The process begins with demand planning (including sales planning and forecasting) and incorporates new product requirements integration and supply and rough-cut capacity planning (production, distribution, and key supplier resources). The next step is the cross-functional reconciliation of plans and the development of recommendations and choices. The process cycle concludes with senior executive business review and approval.

All components of capability (as illustrated on page 10) must be in place for a successful sales and operations planning process. Strategic objectives for the process must be in place, and these must also drive the implementation of the policy, processes, and procedures; organizational leadership; cross-functional teamwork; skills and competencies; information management; scenario-creation; measurement and control capabilities; and supporting systems, tools and data quality, integrity, and availability.

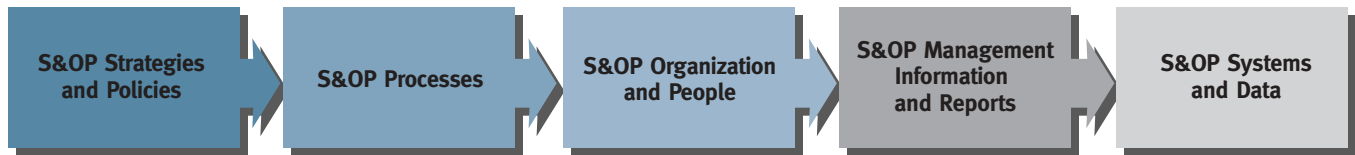
If one or more of these capabilities is deficient, the process will likely fail. The process will be as good as the weakest link (capability). Experience shows that weakness in the organizational capability is the most common cause of failure in the S&OP process. And in particular, the lack of executive-level ownership and commitment to the process is a primary cause of failure or underperformance. Also, in many of these cases the S&OP is led by the supply chain organization. This is a fundamental design and implementation flaw in many organizations and industries.

APICS education, training, and certification (CPIM, CIRM) are the most effective means available to manage and control this very basic and serious weakness.

The absence of high-integrity, timely, and complete information for decision making is the next most common weakness and risk area in S&OP process implementations. This weakness can devastate the process. The following is a checklist of some key S&OP-related risk controls for information for decision making.

- Customer service, order delivery, and/or order backlog performance are reviewed at each pre-S&OP and executive-level meeting.
- S&OP reports are concise, include performance to plan (demand and supply), services statistics, future demand and supply plans, as well as other qualitative and quantitative information identifying assumptions; key observations by executives and others; dependencies; and other important management decision-making and control information.
- Sales, marketing, new product planning, financials and manufacturing/supply strategies, goals, measurements, and plans have been agreed to, communicated, and documented to satisfy requirements for each product.
- Demand and planning time fences have been established and are frequently reviewed and agreed to among sales and marketing and supply chain management/operations teams.
- There are meaningful customer satisfaction and service measurements in place (meaningful in the eyes of the customers). These measurements include up-to-date customer and sales department feedback.
- Controls and reports to identify specific internal and external resource capacity constraints and issues are used to identify where the bottlenecks and/or idle capacity exist and in relation to what product rates/plans.
- Key performance indicator tolerances are defined—time is not wasted on irrelevant variances.
- The reconciliation, recommendations, and choices meetings produce integrated recommendations for the executive group, identifying risks, scenarios, alternatives, assumptions, and so on, and the executive S&OP team decides whether to accept those recommendations or adopt an alternative.
- At the S&OP meeting, the sales and operations plans are compared with the business /operating plan. As appropriate, the business/operating plans are updated to reflect new information identified and agreed upon in the S&OP.
- The master production schedule is audited each month (at least) and compared with the supply/operations plan in the S&OP to ensure that the master schedule is set at the levels specifically approved in the S&OP meeting.

S&OP Process Implementation – Capabilities Overview



PLANNING RISK, ALIGNMENT RISK, AND BUSINESS MODEL RISK	CUSTOMER AND MARKET RISK, COSTS RISK, AND EFFICIENCY RISK	LEADERSHIP RISK, HUMAN RESOURCE RISK, AND CHANGE MGMT RISK	INFORMATION FOR DECISION-MAKING RISK AND MEASUREMENT RISK	INFORMATION INTEGRITY AND TECHNOLOGY AVAILABILITY RISKS
<p>The S&OP vision, objectives, and strategy are clearly and comprehensively defined.</p> <p>S&OP vision is in alignment with the longer-term entity and/or business unit strategic objectives and plans, the process-focused organization, and the various business and risk management strategies.</p> <p>Failure to have these plans leaves the company unable to effectively provide the essential financial and managerial resources and support required to successfully design and implement S&OP and S&OP sub-processes.</p> <p>S&OP is a major priority. Failure to succeed in S&OP will retard the progress toward a process-focused business model, and make the culture changes and expected business results much more difficult to achieve.</p>	<p>The S&OP process includes a) sales planning and forecasting, b) supply planning, c) the means for integrating demand, supply, new products, and financial plans, and d) a process for senior executive teams to review demand and supply performance, plans, choices, and risks and to make decisions. The processes must be designed effectively and in an integrated manner.</p> <p>Success requires senior management's whole-hearted support, dedicated resources, investment, and a highly effective planning and management process.</p> <p>Failure exposes the company to poor supply chain performance and opportunity cost risks.</p> <p>Without a clear and agreed long-term vision, process design, and cross-functional objectives, it may be difficult to separate the two project phases and to recover the credibility of S&OP.</p>	<p>Creating a process-focused organization is a major challenge and commitment in the transformation of the business.</p> <p>Risk abounds in the absence of highly comprehensive and cross-functional people and organizational risk management strategies and development action plans.</p> <p>The development and implementation of S&OP and S&OP sub-processes supports transformation to the process-focused organization. These process design project plans also address critical people and organizational capabilities.</p> <p>There is a) commitment by senior leadership, b) awareness, training, and education for the organization, c) revised rewards compensation schemes, especially for sales and marketing, and d) progressive and focused programs to address common barriers to change.</p>	<p>Considerable effort is required for the S&OP process to provide improved demand and supply information and to get cross-functional agreement and commitment to the numbers.</p> <p>The success of the S&OP processes is founded on the availability of relevant and timely information for decision making, measurement, and control. This information includes sales plans, forecasts, shipments, production, third-party supply data, inventory and financial plans, efficiency, customer service etc. Related goals, measures, action plans, variances, and risks are also critical information needs.</p> <p>Defining information requirements for S&OP processes is foundational to the successful design and implementation of those processes. Information and reporting capability must be incorporated as an essential part of S&OP.</p>	<p>Data standards are essential to the efficient and effective provision of high-integrity information for decision making for S&OP processes.</p> <p>The company's operations and forecasting systems support the needs of sales and marketing and others to efficiently develop and maintain sales plans and forecasts within the S&OP process.</p> <p>There are programs to provide cross-functional, integrated systems and/or there are standardization strategies in place to provide data that explicitly supports S&OP and the S&OP subprocess requirements.</p> <p>Defined S&OP vision and process, information needs, goals, and measurements are prerequisites for an S&OP data standardization plan and information systems strategy for S&OP processes.</p>

Conclusions

The survey results confirm that sales and operations planning is a key risk area and a critical risk management and mitigation practice. It is also a high priority current risk solution/investment area for organizations. Some prerequisites for managing these risks include

- 1) Management runs the supply chain as a *process*. It is not just an organization.
- 2) An aligned supply chain strategic plan is documented and kept current. The plan must include very specific objectives to address the development and implementation of a best-in-class S&OP process where risks, opportunities, and choices are managed.
- 3) The S&OP process is led by the senior executive in the business/business unit.
- 4) All key S&OP capabilities are designed, planned, and implemented in such a way as to achieve the desired level of process maturity. These interdependent process components of S&OP capability include strategy and policy, processes and procedures, organization and skills, information and methodology for decision making (management, measurement, and control), and supporting systems and data (integrity, completeness, and availability).
- 5) S&OP subprocesses are well designed and implemented and include sales planning and forecasting, new product planning and requirements integration, supply and resource and rough-cut capacity planning (including key third-party resources), a process for reconciliation of all plans and for developing recommendations and choices, and an executive-led S&OP review and decision-making process.
- 6) Risks and risk impact are assessed; risks are prioritized; and risk management plans, measurements, and controls are inherent in the entire planning process.
- 7) There is timely, credible, and complete information for decision making, measurement, and control.
- 8) The company runs with one reconciled and integrated plan.

Key indicators of successful S&OP include

- 1) There is evidence of management using the process to run the business
- 2) Superior performance is consistently achieved
- 3) Key demand/supply risks are monitored and managed on a continuous month-to-month basis.

Risk Area #3

Procurement Risk Management – Lack of Information for Strategic Sourcing, Lack of Supplier and Contracts Management Monitoring and Controls, Expenditures not Leveraged

We chose to take a consolidated approach to discussing the procurement risk areas because of the close relationships among these risks and related processes and solutions. It is worth pointing out that procurement risks and solutions are also greatly influenced by the two risk and control areas previously discussed in this document: supply chain/procurement strategic planning and sales and operations planning. Additionally, other risk and solution areas to be covered in this paper—supply interruption and enterprisewide supply chain risk management as well as the Sarbanes-Oxley Act—also have strong interrelationships with the procurement risks and procurement risk management solutions that we are about to discuss.

Forty-nine percent of the respondents identified a lack of good data as a key risk area. This universal problem for supply chain and procurement organizations and their partners has been widely publicized for some time. The problem generally becomes more complex when there are multiple purchasing and accounts payable transaction systems and/or legacy systems in play. As mentioned, in one of these studies the lack of information and expenditures analysis capability was aptly described as a “corporate epidemic” (Aberdeen Group and Penton Media, January 2003). We consistently see evidence that this risk continues to be a significant and ongoing concern for organizations *in all industries*.

In the procurement process, information for decision making (that is, management, measurement, and control information) is a fundamental capability. Without it, even the most qualified and most skillful organization will find it extremely difficult to successfully manage and execute even the best-designed procurement processes or to implement even the most comprehensive and aligned procurement-related strategic plans and policies.

Another key procurement risk noted was the organization’s ability to manage and control supplier and contract performance effectively. This was identified as a major concern for almost half (47 percent) of the respondents. Whereas risks and weaknesses occur at many points along these supplier management and contracting processes, one of the most common and less well-controlled weaknesses occurs in the postaward contract administration/management portion of the process. This is a common problem, even where there is strong discipline in the sourcing, supplier selection, and contract negotiation phases of the procurement process.

Routinely, contract compliance audits detect major weaknesses in postaward contract administration and controls. Put another way, it is common for category/service management teams to expend great effort to develop and negotiate solid contracts with preferred suppliers and then to greatly underinvest in the discipline and accountabilities required to monitor, measure, and control ongoing performance, service and value delivery, and contract compliance.

Robust supplier and contracts management processes and controls, combined with highly disciplined cross-functional strategic sourcing methodology, are excellent proactive risk management tools for the organization. These practices will be discussed in the solutions section.

When one looks at the underlying impact from weaknesses in supplier and contracts risk management and control, some or all of the following concerns stand out.

- Employee/third-party fraud risk—loss of cash, poor press, and reputation damage
- Information security, access, and privacy risk—including unauthorized access to company, supplier, or customer information
- Reputation risk—bad press resulting from supplier actions, the absence of minority/woman/locally owned sources, and so on
- Environment, health, and safety risk—supplier noncompliance, poor sourcing/selection decisions, results in breaches of laws and regulations, and so on
- Inventory and obsolescence risk—poor planning and scheduling and unreliable supplier performance leading to increased inventory (buffers)
- End-customer satisfaction risk—resulting from poor supplier performance that affects end customers and internal users and undermines company’s credibility and predictability
- Authority limit breach risk—a common issue where employees or contractors act as purchasing agents without proper authority and qualifications putting the company at risk from bad deals
- Supply interruption risk (see also separate section on this topic)
- Supplier delivery/quality performance risk—resulting in work delays, inventory carrying cost (buffer), service failure, rework, increased expediting cost, and so on
- Noncompliance with agreed price risk—resulting in poorer financial performance, reduced stakeholder value, the company paying too much for goods and services, and time-consuming and costly disputes that may also follow
- Regulatory noncompliance risk—resulting in supplier action-related fines and bad press
- Terms and conditions (other) risk—leading to a loss of desired value, service, or cash flow expectations and returns to the company from the contract and supplier
- Supplier technology adoption and innovation risk—results in loss of expected competitive edge for the company from the supplier leading to lower technology or uncompetitive end products or solutions for customers
- Supplier financial and technical qualification risk—supplier fails to perform to standard or goes out of business leading to supply interruption
- Contractual and legal risk—leads to costly legal disputes, inability to achieve a remedy after supplier failures, and a lack of protection for the company
- Outsourcing risk—the service or product is outsourced, the risk cannot be. Lack of risk management can lead to loss of control over data security, personnel, process performance, outcomes, and so on

The size of the organization does not appear to be a major determining factor in terms of supplier and contracts management risk. The risk was rated highly for 45 to 50 percent of all organizations, other than for the largest 41 percent. This may seem to indicate that more of the larger companies are making investments in supplier and contracts management capabilities. Our experience in the field would tend to bear this out in many cases.

The risk that total expenditures with third parties are not leveraged scored a good deal lower than we had expected in this section of the survey. Overall, just 29 percent of respondents saw this as a major risk. This might indicate that more than 70 percent of the respondents believe that this area of risk is well controlled in their companies. To accept this at face value may understate the existence of additional opportunities and risks.

This topic will be explored further when we discuss solutions for this risk area. In our experience and further evidenced by a variety of other surveys, we find that organizations are typically focusing on no more than 50 to 60 percent of their total expenditures. This leaves a great deal of additional room for improvement and management of sourcing, supplier and contracting value, and risks.

When feedback on potential solutions for supply chain risks was analyzed, it was found that 44 percent of respondents considered spend aggregation and spend analysis tools to be high-impact capabilities and solutions. Additionally, 62 percent highlighted the importance of an effective corporatwide strategic sourcing process as a top priority. That is also consistent with our more recent experience in the field and reflects the ongoing need within companies to improve profitability and enhance revenue through effective sourcing, supplier selection, and management of the supply base and contracts.

The continuing explosion in growth of global sourcing, outsourcing in manufacturing and distribution, and business process outsourcing creates a variety of opportunities, risks, and requirements for organizations of all kinds. More emphasis and rigor than ever are required as organizations attempt to design and implement effective strategic sourcing capabilities.

We view strategic sourcing capabilities as one of the greatest proactive risk management tools available to supply chain and procurement organizations. Supply profit impact on the organization and supply risks are formally analyzed and prioritized before sourcing and risk management strategies are developed. Strategic sourcing is a foundation for supply interruption risk management and for overall enterprisewide supply chain risk management (covered in risk and solution area #4).

So, what procurement process risk solutions are organizations investing in at this time? The data on current higher priority solutions showed that 49 percent were investing in strategic sourcing, while 47 percent were focused on supplier and contracts management as top priorities.

A lesser number were addressing the tools to support these processes, which indicates to us that supply chain and procurement organizations are not getting the tools they need to most effectively leverage, manage, and control supply-based expenditures and risks.

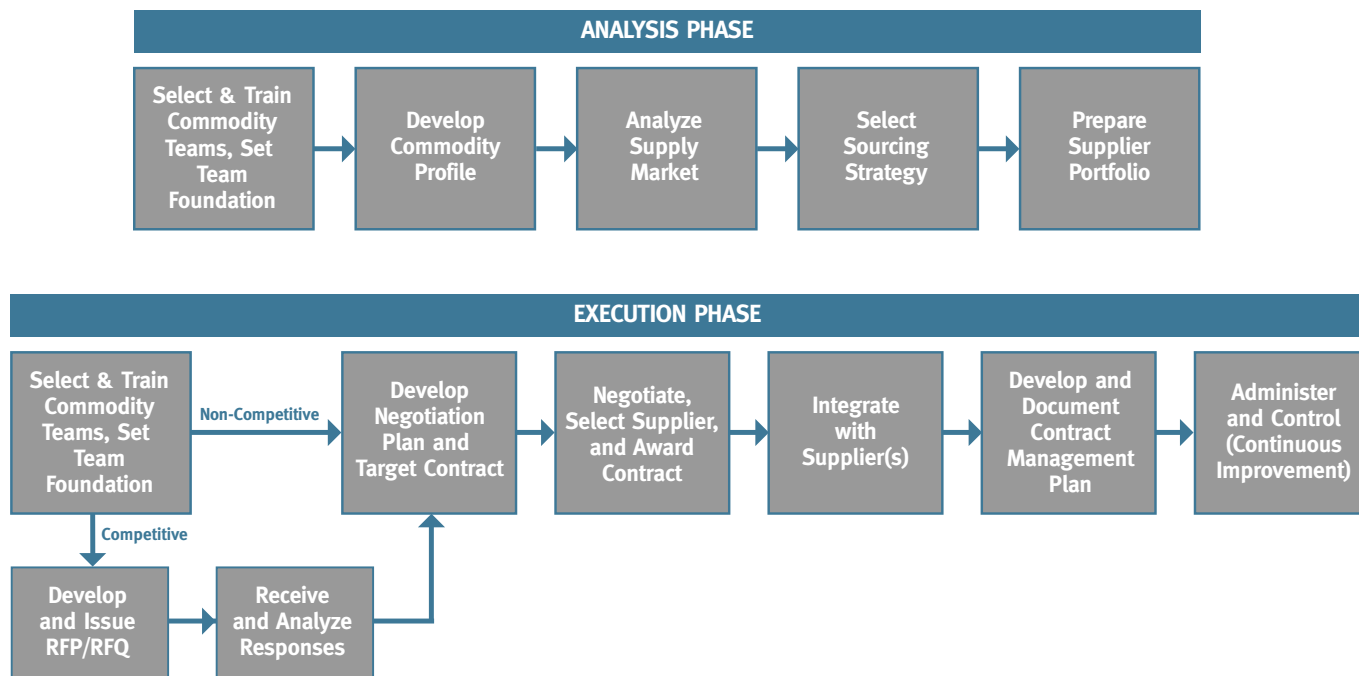
This lack of investment in information for decision making (management, measurement, monitoring, and control) capability and supporting systems/tools and data leads to what was described previously as the “corporate epidemic.”

Without the information for decision-making capabilities and supporting systems and data capabilities, it is highly unlikely that personnel can effectively and efficiently operate even the most robust sourcing, supplier, and contracts management process and execute the strategic plan.

This may be an opportune time to revisit the procurement process capabilities and capability interdependencies.

Strategic sourcing and related practices and disciplines create the strategies that then drive the supplier selection process, contracts planning, negotiation, contracts administration and control, and supplier management activities. These make up a set of powerful procurement risk management practices and are summarized in the process overview on the following page.

Strategic Sourcing, Supplier Selection, and Contracts Management Process Overview



Analysis Phase

Having initially analyzed expenditures and defined commodity or spend category groupings, the organization creates cross-functional sourcing teams and conducts an initial market analysis for the category. It is important to train the teams about risk management concepts and strategic sourcing, supplier selection and procurement, and contract management processes and techniques.

In the next step, the team carries out a detailed analysis of the supply market. The objective is to gain a thorough understanding of the local and/or global supply market, the relative bargaining power of the organization, and the range of risks associated with that supply market. Understanding the historical and forecasted demand, potential expenditures, impact on profitability, and so on, the team can then map this information and use it to select the most appropriate sourcing strategy for the particular category of spending for the company.

After some final analysis of the market (to validate the sourcing strategy), the team is ready to determine a supplier selection approach and implementation path and to define the type of contractual arrangement that best meets the strategy and the desired supplier relationship.

Execution Phase

The chosen sourcing strategy will dictate whether or not a request for proposal (RFP) or request for quotation (RFQ) is desirable. That decision will be based on the selected sourcing strategy. The sourcing strategy was determined by evaluating the supply risk, the buyers' bargaining power, the potential impact on business results, and the type of relationship that the organization desires to create and maintain with the supplier(s). *This is proactive risk management.* The sourcing strategy should dictate the approach and the supplier relationship for the category (e.g., strategic, leveraged, bottleneck, noncritical, etc.).

Having gone through the supplier selection process (competitive or noncompetitive) and selected the type of contract that best fits the strategy, the organization develops a negotiation plan and selects the specific contract for the negotiation.

Once the plan is clear, the team can enter negotiations and award the contract. A key activity should now occur—the creation of a contract management plan. This plan will define exactly how the contract will be administered and controlled and how supplier performance and compliance will be managed, measured, monitored, and controlled and by whom, specifically.

The organization is now positioned to continuously administer, manage, and control contract and supplier risk and performance. Most of these concepts are not new. However, because there may be a lack of information, tools, training, process definition, or discipline, this continues to be an area of significant weakness among organizations of all sizes and in all industries.

Contracts Management Risk in the Financial Services Industry

Our experience across a range of these companies has provided growing evidence of contract management risks. Many organizations within the financial services industry have pursued business process outsourcing strategies to focus their attention on core competencies. At the same time, the industry has become subject to more and more regulation. Contracts and relationships with outsourced IT and other service providers can pose considerable financial, service, legal, regulatory, and other operational risks to these businesses if they are not effectively developed and managed.

The management of these relationships is often fragmented within organizations, with inconsistent risk management and control practices. This inconsistency often results in higher overall service costs and gaps in the overall risk management process related to third-party relationships. Risk assessment of third-party relationships is essential and mandated by regulatory authorities to control the risks related to third-party services and processes that are outsourced.

Whereas the services can be outsourced, the risk cannot. It is retained by the organization. For example, if a third-party service provider does not ensure the privacy and security of customer data and information, it is normally the financial services company that will held accountable and will be subject to legal, reputation, financial, and other risks.

The process for procuring and contracting with third parties for services should be an important portion of the overall risk management program related to third-party relationships. Effective management of the suppliers and contracts for these services reduces overall costs and can fund the risk management processes that must be performed related to third-party services.

Some of the most common risk areas associated with supplier and contracts management administration and control in the financial services industry include

- Regulatory, compliance, financial, business continuation, and other service risks
- Concerns about supplier security and confidentiality controls
- Transfer of nonpublic personal customer information to a third-party and the need to comply with applicable privacy regulations
- Insufficient monitoring of service performance and billing
- Changes in market forces or contract/service scope
- Instances of noncompliance and poor service levels—recent customer complaints
- Recent change in contract management personnel, either within the business or at the service provider
- Unauthorized or uncontrolled use by the supplier of other third parties or assignment of contract to others
- Billing issues and exceptions—service costs out of line with expectations
- Poor financial health of service provider
- Deteriorating relationship with the service provider

Whereas this survey enjoyed minimal response from this large industry sector, similar sourcing, supplier management, and contracting risks exist for these organizations. Therefore, it is important that these organizations adopt many of the same supply and procurement risk management controls and techniques.

Contract Management Planning (all types of contracts)

Contract administration and risk and control roles and responsibilities must be clearly defined, regardless of industry or product/service type. The contract management roles should be identified as part of the contract management-planning phase of the process. Key stakeholders to the contracts administration process are mentioned below.

Contract administrator: This person should be knowledgeable regarding the service, program, or product. The person should have ongoing management responsibilities for the contract. Sometimes this can be a supply chain/procurement person. This depends on the nature of the contract, company policies, and individual circumstances. The contract administrator has day-to-day responsibility to ensure that goals are met, for reporting, for overseeing payments, and for ensuring compliance and control. He or she should be the contact point to deal with the supplier for problem resolution and overall contract performance and control.

Supplier: There should be one primary supplier contact for the contract—the contract administrator’s counterpart. This makes for a much more effective and efficient control process.

Subcontractors: The deal may contain provisions for subcontracting. However, the supplier contact is responsible for the contract and for the management of subcontractors.

The contracting organization should deal directly with the supplier. Though the buying organization may work directly with some subcontractors, it should be the supplier’s responsibility to manage all subcontractors. There is normally no contract between the buyer and the subcontractor.

The supplier may include a number of subcontractors in the delivery of the service and/or product. Subcontractors are normally approved by the buying organization as part of the initial contract development process. If a subcontractor is changed during the contract, the buyer should (generally) retain the right to approve the proposed subcontractor. This should normally be agreed upon in the terms of the contract.

Procurement: The procurement team typically leads the sourcing process and deals with the original request for proposal/bid (where appropriate) and for the selection of the supplier. Procurement would also lead in the selection of the appropriate contract type. The procurement team provides the process and commercial expertise and should also provide support to the contract administrator during the period of the contract, assist in solving any contractual disputes that may come up, and negotiate changes and amendments to the contract.

Legal support: Depending on the organization, legal professionals may help with the negotiation of the contract. They should be also be used as advisors during the administration of the contract in the event that any legal issues arise.

Finance organization: Supports the contract administrator and procurement personnel on issues such as financial data analysis and modeling, budget, invoicing, and payments.

Quality management and quality control: Specific roles should be determined as appropriate to help ensure quality standards are met proactively (often at the supplier’s premises), in the field on delivery, and in general throughout the execution of the contract. Depending on the nature of the service or product, the team develops specific quality programs, standards, and inspection and acceptance procedures.

End-users of the goods/services: End customers from user organizations may play key roles also in terms of the development of scopes of work, specifications, and acceptance and approval of goods and services provided through the contract. These roles must be defined in the contract management plan.

Executives: As ultimate owners of the business performance and control, senior executives should be closely informed of supplier and contract risks and mitigation plans, buy into the strategy, and be informed of any serious issues as they arise.

Conclusions

The survey results confirm that strategic sourcing and contracts and supplier management process risks continue to provide management with major challenges and opportunities. Following are some of the key points associated with these risk and solution areas.

- 1) Effective management, measurement, and control of suppliers, contracts, and overall expenditures by category/commodity is an ongoing and serious risk area and challenge for management.
- 2) Major contributors to this risk include a) the lack of timely, complete, and accurate information; b) the lack of tools and methodologies to analyze data; c) the integrity of the raw data (coding standards, etc.); and d) the variety and diversity of systems from which the data must be extracted.
- 3) Postaward contract management and control (administration) are significant areas of weakness in organizations of all kinds. This is especially the case in noninventory situations. Roles must be clearly defined as part of the process.
- 4) Whereas sourcing leverage has been the focus for many to support cost reduction demands, less than 60 percent of total expenditures are typically leveraged.
- 5) The availability of information for decision making, measurement, and control to support strategic sourcing and contracts management, along with the tools and methodologies to support these needs, continues to be a major barrier.
- 6) Strategic sourcing methodology, incorporating robust and disciplined analysis; strategy selection; supplier selection; and contracts planning, negotiation, and control, form an outstanding and proactive set of risk-assessment, risk-management, and risk-control capabilities.
- 7) The provision of effective and efficient strategic sourcing, supplier, and contracts management capabilities should be addressed as part of a continuous supply chain/procurement strategic planning process (see also section 1).
- 8) We need to refocus on the risk management disciplines inherent in a formal and rigorous strategic sourcing methodology. Too often, supply chain/procurement personnel have to deal with incomplete information and have too little time to spend on the market, risk, and spend analysis components of their work.
- 9) Defining information for decision-making requirements and supporting systems and data capability needs to support critical procurement processes, and the provision of these capabilities should also be addressed as part of the overall short-, mid-, and long-term supply chain/procurement strategic plans.

And finally, between 40 and 60 percent (or more) of an organizations' revenue is spent (typically) with third-party suppliers of goods and services. The universe of risks and impact possibilities surrounding the provision of these goods and services is enormous. Yet, many organizations continue to underinvest in the strategies, processes, skills, information, systems, and data disciplines required to effectively manage these risks (see also risk area #4).

Risk Area #4

Supply Interruption

Supply interruption risk was the clear winner in this survey. Of those surveyed, 66 percent agreed that supply interruption was the highest risk. Despite some appearances of sophistication, performance improvements and predictability, consistency, and agility, supply chains today are still extremely fragile and exposed to interruptions of all kinds.

Supply interruption risk has a very different meaning for different people. Events of the past several years that caused delays to the supply and distribution of products globally often had roots in largely uncontrollable events such as acts of terrorism, infectious disease outbreaks, natural disasters, and so on. Resulting blockages and restrictions in supply pipelines caused severe problems for organizations and have heightened the awareness and fear of supply interruption risks across many economies and industries. The best practice to address these types of risks is to have contractual contingency plans, supply sources, and substitute materials and services that can be put into play temporarily and on short notice.

More controllable and predictable supply interruption risks continue to challenge management. These more controllable risks include supplier failures (technical or financial) that can occur at any point or level in the integrated supply chain. Other risks include demand and supply fluctuations that result in allocation of supply and other outcomes and channel or other supply line interruptions resulting from foreseeable labor disputes.

The industry response was interesting. Eighty-three percent of respondents in the aerospace and defense industry ranked supply chain interruption risk as a significantly high risk. This high percentage may demonstrate the elevated degree of concern the industry may experience with supply interruptions that cause delays to critical programs and products. The risk is a major concern to most practitioners and other managers across the range of industries responding.

Successful management of supply interruption risks requires the organization to have an ability to be proactive in identifying supply interruption risks. Once these risks are identified, organizations should have a process to

- Evaluate the potential impact of those risk events
- Assess the likelihood of occurrence
- Assess the resulting impact of such occurrences
- Prioritize which specific risks to manage
- Agree on risk tolerances
- Obtain cross-functional executive-level buy-in to make appropriate investments in risk management and contingency plan programs

Executive-led sales and operations planning (risk area #2) can be an excellent forum for such decisions.

Let us briefly examine uncontrollable versus more controllable supply interruption risk areas. By uncontrollable supply interruption risks, we mean risks that result from causes that cannot be readily controlled by the members managing the supply chain in question. Examples include the repercussions of the terrorist bombings in 2001 when trade through a wide variety of distribution channels and ports was affected in an extreme way.

As terror alert levels change from period to period, the movement of goods is slowed or accelerated. Similarly, when SARS reached its peak several months ago, a global nervousness about conducting business in China emerged, and travel to China and business with its markets was greatly curtailed. The wisdom of global sourcing comes into the spotlight from these events.

Dealing with these more uncontrollable supply interruption risks demands that organizations employ the many standard risk management and controls tools at their disposal (strategic, sourcing, supplier and contracts management and control, and so on), along with more robust additional contingency planning approaches and other additional measures.

Among the considerations facing many globally sourced organizations is how to deal with Homeland Security guidelines as well as guidelines such as those coming from the Customs-Trade Partnership Against Terrorism (C-TPAT). Organizations that comply with such guidelines can have a terrific advantage in getting their products moved through the ports quickly.

More and more organizations are considering doing full risk assessments of the security of their supply chains. This entails an evaluation of risk along every step of the chain, from the source of the basic raw materials through staging areas, manufacturing sites, warehouses, distribution and transit points, conveyances of all kinds, and so on. The effort is intended to identify, manage, and track all security risks along the chain, including the screening of a wide range of personnel at all sensitive access points and the security of the buildings and all conveyances along the route.

Organizations that can show regulators and agencies there is a thorough and constant assessment, control, and surveillance of these components of risk as well as tools and databases to effectively manage it, may find themselves with a strong competitive advantage over other supply chains with port regulators and other agencies as well as having a better handle on the actual risks to security and supply. This is an evolving area of supply risk and supply interruption risk assessment and management.

Meanwhile more controllable supply interruption risks are those that supply chain professionals and stakeholders face and worry about every day. Any form of delivery or quality problem, short- or long-term, fits into this description. These risks are everywhere and exist for everybody. So what tools does management have at its disposal to deal with supply interruption risks?

We have just discussed several of the required risk management tools to manage risk areas #1, #2, and #3. The research further indicates how important it is for organizations to have a clear and complete strategic plan; implement an effective executive-led S&OP process; and develop and implement robust strategic sourcing, supplier selection, and supplier and contracts management processes. These processes need to be managed and executed by qualified and skilled personnel using reliable and complete models and information supported by the appropriate tools and data. Let us return to the survey data and see what respondents had to say about the most desirable and the in-progress solutions.

As noted earlier, the desirability of having an integrated supply chain/procurement strategic plan ranked first as a risk solution. Executive-led S&OP; strategic sourcing; and supplier and contracts management processes, controls, information for decision making, and tools were other high-scoring supply risk management solution capabilities and were addressed in risk sections #2 and #3.

Each of these capabilities and solutions contributes to proactively planning for and managing supply interruption risks. This section of the survey introduced an additional concept described as a formal and effective enterprisewide supply risk management process. That concept as a solution ranked second highest at 63 percent. More on this key point later.

Let's now take a look at where organizations are currently focused in terms of making investments in solutions.

Though overall percentages were down somewhat, the current focus in terms of investment in solutions for managing supply risk were similar to those identified as the preferred or desired best practices and solutions. One major exception stood out for us. Whereas 63 percent saw a formal enterprisewide supply chain risk management process as a best solution, only 36 percent are currently focusing on developing such a process.

We were pleasantly surprised to see that the number was as high as 36 percent. Enterprisewide risk management (EWRM or ERM) capability is still emerging (see risk area #5 - Sarbanes-Oxley Act Compliance and Controls) for most organizations with whom we work. And, without an overall and effective organizational EWRM framework it is more difficult to carry out an enterprisewide supply chain risk management process effectively.

EWRM is a deserving topic for another white paper in its own right. There is an ever-growing focus on corporate governance and related risk management and controls. This attention is driving more and more organizations to think about risk and controls from an enterprise perspective. This enterprise focus will provide the framework and processes that will also help force supply chain risk, specifically supply interruption risk, into the minds and actions of the most senior executives and board members and cascade into the other supply chain and procurement strategies, processes, and methodologies.

In the meantime, supply chain executives can begin to take an enterprisewide approach to identifying, prioritizing, and mitigating a range of supply-related risks, including the risk of supply interruption. We will now outline a set of processes for supply interruption risk management, using the wide range of effective supply chain tools and processes at our disposal. Many of these have already been discussed in some form in the previous sections but are included here as they relate to supply interruption.

Step 1. Expenditures

Understand what has been spent and what is forecasted to be spent, on what (goods and services), and with whom—all third-party spend for goods and services. Segment expenditures by grouping (commodity or spend category of goods and services). Analyze the data and validate the analysis results.

Step 2. Detailed Analysis

Select appropriate subcommodities/spend categories for detailed analysis. Then, carry out market assessment—identify the current supply base and the potential supply base. Understand the supply market dynamics and so on.

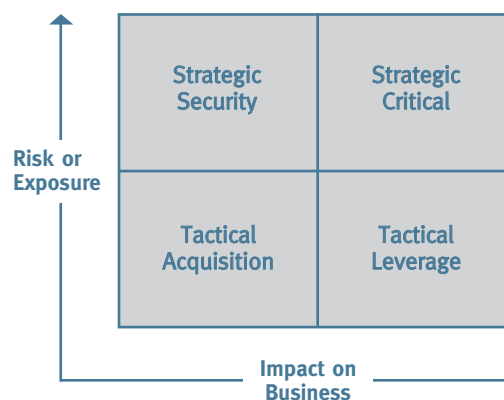
Further refine subcommodity/spend category selection based on a) supply market analysis, b) supplier technology innovation, c) global supply risks and opportunities, and so on.

Analyze and position specific subcommodities on the sourcing strategy matrix (see diagram below).

- **Influence on Company Results/Profit Impact Risk Criteria** – weighted elements of market success. Possible elements to be used in measure/analysis include
 - Costs
 - Quality
 - Time/availability
 - Technology content
 - Safety/environmental specs
- **Procurement Risk Criteria** – use weighted elements such as
 - Bargaining power
 - Ease of substitution
 - Supplier rivalry
 - Barriers to entry for new suppliers

Plot subcommodity/spend category on sourcing strategy matrix (see diagram below) and validate results.

Supply Positioning Analysis –Sourcing Strategy Matrix



Step 3. Select/Prioritize SubCommodities for Sourcing and Risk Management and Execute Sourcing Process

- Select subcommodity sourcing and risk management strategy
- Apply information from subcommodity analysis
- Carry out final market analysis and validate/confirm sourcing and risk management strategy
- Carry out detailed supplier risk analysis (prioritize sole and single source as appropriate)
- Carry out supplier financial risk analysis (see sample tool at end of section)
- Carry out additional supplier qualification procedures and audits (as appropriate)
- Assess key suppliers in the following elements of capability including
 - a) Business and supply chain strategy and policy
 - b) Supply chain process capabilities and supply risk management capabilities
 - c) Organization culture and capabilities
 - d) Information for decision making, measurement, and control capabilities
 - e) Systems and data, including those critical for the efficiency, effectiveness, and control of demand and supply processes

Step 4. Carry out overall supply risk assessment and measurement activity for the supplier and evaluate specific supply and supply interruption risks to the organization, such as

- Expedited freight costs resulting from poor planning (underplanning)
- Cancellation costs resulting from poor planning (overplanning)
- Obsolescence costs from poor planning (overplanning)
- Inventory carrying costs from poor planning (overplanning)
- Unplanned allocation price increase costs (market demand/supply)
- Unplanned costs caused by yield problems
- Unplanned costs caused by spec changes
- Lost revenue caused by poor planning (under planning)
- Lost revenue caused by late delivery (supplier performance)
- Lost revenue caused by quality defects (supplier performance)
- Lost revenue caused by poor new product planning and execution
- Lost revenue caused by global sourcing country risks
- Increased costs caused by lack of good analysis and planning when price contracting through the phases of product ramp up and ramp down
- Unplanned investment to support single/sole source
- Unplanned costs caused by currency fluctuations

Use simple-to-understand and easy-to-use supply risk measurement processes and models to support

- Development of supplier-specific risk impact and mitigation plans
- Likely returns on investment for review and approval using supply risk measurement tools (example on the following page)

Process Steps

1. Identify potential supply chain risks
2. Calculate the profit impact in millions for two consecutive years if the risk were to occur
3. Estimate the probability of occurrence before control implementation (in percent) for 2 consecutive years
4. Identify controls to mitigate the risks
5. Estimate the effectiveness of the newly implemented control
6. Calculate the cost of the control
7. Calculate the impact on profit in millions for 2 consecutive years (if the risk were to occur to a lesser extent in year 2, based on control effectiveness and probability)
8. Estimate the probability of occurrence after risk control implementation (in percent) for 2 consecutive years and the Control ROI
9. Implement controls and continuously monitor

Risk		Risk	Control	Must Enter In Millions				
				One Time Cost	Year 1 Cost	Year 2 Cost		
1		Expedited freight costs resulting from poor planning (under planning)	\$	1	\$	1	\$	1
2		Cancellation costs resulting from poor planning (over planning)	\$	1	\$	1	\$	1
3		Obsolescence costs from poor planning (over planning)	\$	1	\$	1	\$	1
4		Inventory carrying costs from poor planning (over planning)	\$	1	\$	1	\$	1
5		Unplanned 'allocation' price increase costs (market demand/supply)	\$	1	\$	1	\$	1
6		Unplanned costs due to 'yield problems'	\$	1	\$	1	\$	1
7		Unplanned costs due to spec changes	\$	1	\$	1	\$	1
8		Lost Revenue due to poor planning (under planning)	\$	1	\$	1	\$	1
9		Lost Revenue due to late delivery (supplier performance)	\$	1	\$	1	\$	1
10		Lost Revenue due to quality defects (supplier performance)	\$	1	\$	1	\$	1
11		Lost Revenue due to poor New Product planning and execution	\$	1	\$	1	\$	1
12		Lost Revenue due to Global Sourcing 'country risks'	\$	1	\$	1	\$	1
13		Increased costs due to lack of good analysis and planning when price contracting through the phases of product ramp up and ramp down	\$	1	\$	1	\$	1
14		Unplanned investment to support single/sole source	\$	1	\$	1	\$	1
15		Unplanned costs due to currency fluctuations	\$	1	\$	1	\$	1
16			\$	1	\$	1	\$	1
17			\$	1	\$	1	\$	1
18			\$	1	\$	1	\$	1
19			\$	1	\$	1	\$	1

Then

- Seek cross-functional approval for plans
- Seek executive-level approval for plans
- Replan as necessary
- Get final approval of specific supplier risk impact and mitigation plans

Step 5. Execute Sourcing and Risk Management Strategy

- Determine implementation path and contract plan
- RFP/RFQ as appropriate
- Develop negotiation plan and target contract
- Negotiate and award contract
- Develop contract and supplier management, compliance, and risk control plan
- Execute and administer contract and supplier management and control plan including
 - a) Continuous financial qualification/risk assessment and monitoring (see example on the following page)
 - b) Continuous operational risk assessment and monitoring
 - c) Supplier audit and supply chain risk audit programs
 - d) Supplier performance and compliance measurement and reporting

Financial Qualification/Risk Model

Company Scorecard

Select a Company:

	Score	Weight	
Profitability:	<input type="text"/>	1.00	Total Score: <input type="text"/>
Liquidity:	<input type="text"/>	1.00	
Asset Management:	<input type="text"/>	1.00	
Financial Leverage:	<input type="text"/>	1.00	
Market Valuation:	<input type="text"/>	1.00	
Cash Flow:	<input type="text"/>	1.00	

Conclusions

The survey indicated that supply interruption risk is the most pressing concern for many respondents. Supply interruption risk concerns have always been a day-to-day high priority for supply chain executives and professionals. The arrival of the war on terrorism and infectious diseases as well as continued velocity in the growth of global sourcing and business process outsourcing have increased both the likelihood and impact of supply interruption events.

Organizations need to consider

- 1) An overall supply chain and procurement strategic plan needs to incorporate, demand, and define processes and controls that ensure supply interruption risks are managed in a formal and proactive manner.
- 2) Executive-led sales and operations planning is an ideal executive forum for shared, cross-functional, enterprisewide supply risk management, risk-tolerance measurement, control, and decision making.
- 3) Strategic sourcing contains best risk management practices that help enable management to identify risks, including supply interruption, and build strategies and contingency plans to help manage these risks.
- 4) Robust contract and supplier management practices and controls enable the organization to monitor supply interruption and other risks and take proactive risk mitigation actions.
- 5) Effective management of supply risks, including supply interruption risk, requires that skilled and qualified professionals have access to timely, accurate, and complete information, produced from highly credible data, and have the systems and tools to turn this data into useful information.
- 6) Supply interruption and other supply risks should be evaluated based on likelihood and impact, and enterprisewide supply risk mitigation strategies and investments should be similarly evaluated and agreed upon based on solid ROI analysis and prioritization of risk and impact.
- 7) Critical supply relationships should be evaluated continuously and suppliers audited and requalified on an ongoing basis to reduce the risk of supply interruption and supplier failure.
- 8) Key suppliers in the organization's supply chain should be assessed routinely to ensure they have the strategies, policies, processes (including risk management), organizational and skills capabilities, information for decision making, and systems and data to meet and match the buying organization's needs on an ongoing basis.

Risk Area #5

Sarbanes-Oxley Act Compliance and Controls

The establishment of an effective supply chain management program to mitigate Sarbanes-Oxley Act issues was rated as the lowest priority in all three questions of the survey. We were not entirely surprised. We had expected supply chain professionals to be absorbed by other initiatives such as integrated operations planning, aggregated spend analysis, and supplier and contracts management controls, and so on. These results, combined with other evidence from the marketplace, suggest that these important corporate governance requirements are considered to be a finance function by many supply chain leaders and professionals.

It is evident in the data that the fundamental operational requirements needed to run the supply chain process, to satisfy internal and external customer requirements, and to meet the wide variety of traditional performance expectations will remain the true pain points for these organizations. From the survey results we could conclude

- 1) Operations executives, supply chain or otherwise, remain focused on what is germane to them and inherent in their day-to-day responsibilities
- 2) Respondents feel comfortable with their internal control environment and the adequacy of their policies and procedures, and believe that these are reasonable, consistently applied, and well understood
- 3) Respondents do not have a clear understanding of the requirements of the Sarbanes-Oxley Act or its relevance to supply chain processes
- 4) Respondents believe that they are not directly affected by the act now or in the future

Furthermore, the results do not show an industry or company size bias. The approximately 500 respondents were not from an even distribution of roles/titles, industries, size of business, or legal entities (public versus private). Therefore, as in all other sections of this paper, we have supplemented the results of the survey with insights drawn from recent experience in the risk management and controls marketplace.

The data in the survey, when combined with our own experience as managers in industry and as risk and process consultants, leads us to conclude the following about operations and supply chain management leaders and professionals.

- Business leaders place high reliance on the procurement, inventory management/valuation, sales/returns, and distribution capabilities and controls (especially within the manufacturing, distribution, technology, energy, consumer products, and retail sectors).
- Organizations have become more decentralized (global or domestic) and, as seen in other sections of this paper, often suffer from a lack of consolidated or consistent, timely, and complete procurement, shipping/receiving, and accounting and financial reporting information for decision making (management, measurement, and control).
- Businesses have multiple legacy systems, numerous instances or versions of ERP systems, or lack effective enterprisewide IT and data integrity strategies controls.
- Management has limited resources (time, money, or personnel) to invest in and address the requirements and implications of the Sarbanes-Oxley Act.

Most supply chain organizations are less likely to be concerned or aware of Sarbanes-Oxley Act compliance requirements and controls. These organizations are more likely to place a higher reliance and level of accountability on operational process owners who may or may not fully understand or appreciate the direct financial linkages of their day-to-day activities. The supply chain and many of the controls within it have a direct impact on the financial statements and, therefore, will be scrutinized for compliance with the Sarbanes-Oxley Act.

The Sarbanes-Oxley Act

The Sarbanes-Oxley Act was enacted in 2002 as part of the efforts to help restore investor confidence in the integrity of financial reporting (Reference: *the Protiviti/APICS white paper “Capitalizing on Sarbanes-Oxley Compliance to Achieve Competitive Supply Chain Advantage: A Back-to-Basics Approach to Internal Control and Supply Chain Transaction Integrity, published on the APICS and Protiviti web sites in 2003”*). The act requires certifying officers to file an internal control report that must articulate management’s conclusion on the effectiveness of these internal controls. The company’s external auditors must audit and opine on management’s report.

At first glance, the requirements of the act are seemingly esoteric and are often analyzed and understood only by finance, risk management, accounting, audit, and senior executive personnel. Three of our four opening conclusions for risk area #5 support the perspective that the respondents of this survey (individuals who are largely from outside of finance, risk management, accounting, audit, or executive) might have an in-depth understanding of and/or believe that they are not significantly impacted by the requirements of the act.

What operations personnel should begin to understand is not what the Securities and Exchange Commission or Public Company Accounting Oversight Board have written in legislative documentation but what it is that they are trying to accomplish. The essence of the act (Section 404) requires management to conclude on the effectiveness of internal control over financial reporting. And, critical elements of financial reporting are, in fact, affected by supply chain activities.

The expectations are better defined below.

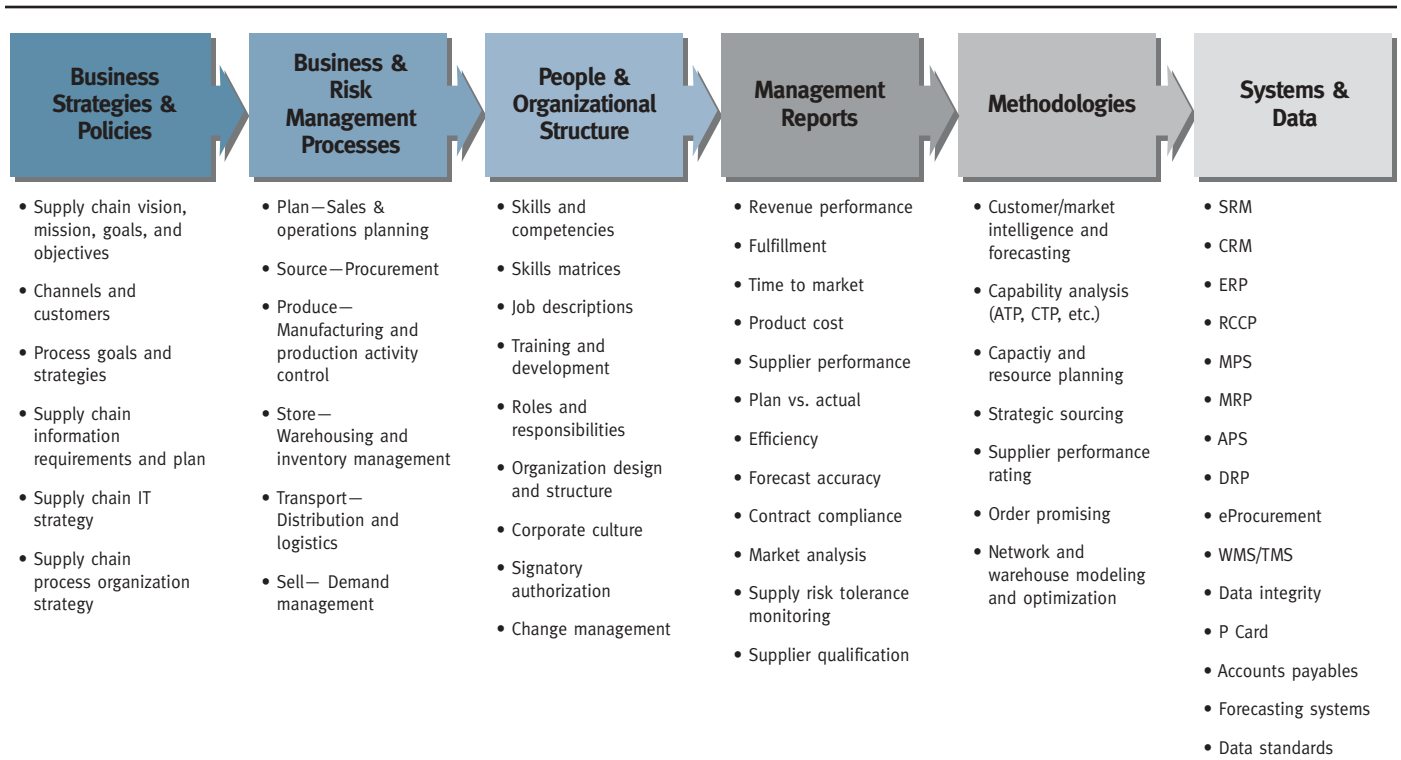
Management – Management describes the certifying officers of the corporation who typically include the CEO, CFO, CIO, and directors. In most if not all cases, management (as defined here) obtains its reliance on the internal control environment in a cascading manner. That is, instilling accountability and formal or informal sign-off by direct reports. The cascading chain most typically continues down to a level of control ownership. For example, the procurement function may be responsible for the authorization of purchase orders above \$1,000,000.

Internal Control Over Financial Reporting – This is not limited to the set of internal controls that govern the accounting processes. Rather, it is the full set of controls that relate to any business process that may have a significant impact on a line item within the balance sheet or income statement (cash, inventory, accounts payable, revenue, cost of goods sold, and selling general and administrative).

Furthermore, it should include internal controls over automated processes as well as manual processes. Controls over these processes often include segregation of duties, spend authority levels, policies and procedures, physical inventories, cycle counting, and system security.

The graphics on pages 31 and 32 further demonstrate the extent to which supply chain processes and controls can affect financial reporting.

Supply Chain – Risk Management Infrastructure



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Supply Chain Risk Management Infrastructure: This is a listing of the highly interdependent components of supply chain management capability. It incorporates the strategic and policy components, process and procedural design, organization skills, competencies, and culture required to execute the strategies and manage the processes and the reporting and controls, methods of modeling and reporting, and supporting systems and data capabilities.

The second process, methodologies, and systems columns show a partial list of operational business processes and applicable systems to be considered in the context of Sarbanes-Oxley Act compliance risk. The following table helps to depict the mapping of supply chain transactions from a Sarbanes-Oxley Act perspective.

Supply Chain Transaction Mapping

SUPPLY CHAIN BUSINESS PROCESS	SUPPLY CHAIN TRANSACTIONS	FINANCIAL – BALANCE SHEET	FINANCIAL – INCOME STATEMENT	SUPPLY CHAIN (EXAMPLES)
ACTIVITY LEVEL				
Plan	Raw Materials Purchased	<ul style="list-style-type: none"> • Raw Materials • Accounts Payable • Cash and Debt 	<ul style="list-style-type: none"> • Cost of Sales 	<ul style="list-style-type: none"> • Supplier Delivery Performance • Cost and Quality • Planned Deliveries
Source	Purchase of Equipment Direct and Indirect Material & Services	<ul style="list-style-type: none"> • Property & Equipment (net) • Accounts Payable • Cash and Debt 	<ul style="list-style-type: none"> • Depreciation • Taxes 	<ul style="list-style-type: none"> • Supplier Delivery Performance • Cost and Quality • Planned Deliveries
Produce	Products are Manufactured or Raw Materials are Converted	<ul style="list-style-type: none"> • Raw Materials • Work-in-Process • Accounts Payable • Accrued Expenses • Wages Payable • Cash 	<ul style="list-style-type: none"> • Cost of Sales • Wages • Utilities 	<ul style="list-style-type: none"> • On-Time Delivery • Quality and Cost • Routing Accuracy • Production Plan Performance • Production Schedule Performance • Scrap Rate • WIP Levels • Planned Production
Store	Raw Materials, Work in Process, or Finished Goods are Stored	<ul style="list-style-type: none"> • RM, WIP, FG • Accounts Payable • Accrued Expenses • Wages Payable • Cash 	<ul style="list-style-type: none"> • Cost of Sales • Wages • Utilities 	<ul style="list-style-type: none"> • Inventory Accuracy • Queue, Buffer, and Safety Stock Levels • Inventory Turnover • Scrap Rate

Supply Chain Transaction Mapping (left to right flow): Hundreds, if not thousands, of transactions exist within the business processes, also shown in the previous graphic. Many of these operational business processes have an impact on financial reporting. For example, the purchase, receipt, and use of raw materials has an impact on cash, accounts payable, inventory balances, reserves, cost of goods sold, and others.

Management's conclusion on its internal control over financial reporting clearly includes those controls that exist within any business process or application and that ultimately affect the balance sheet and income statement.

In the opening analysis of risk area #5, we made reference to the characteristics of organizations that most likely consider compliance to be a priority. Generally, the characteristics of those organizations include environments that are most difficult to control. The difficulty can result from either decentralization, which may increase the probability of process variations and inconsistency, or a very large number of system hand-offs or interface points.

Looking at the above graphic, we can begin to understand the number of control points throughout the organization that help mitigate the risk that the balance sheet and income statement are adequately (and accurately) capturing economic events such as the acquisition of inventory or payments or commitments to suppliers.

These controls do not reside in finance, accounting, audit, or executive. Rather, they reside within the supply chain and operations. Therefore, the management of the risk associated with aspects of Sarbanes-Oxley Act compliance must be addressed.

Internal Control

Internal control is another topic that often leads to the glazing of the eyes for most sales, marketing, supply chain, and operations personnel. The term itself might seem to imply that individuals are not capable of carrying out their day-to-day duties of running the business without someone watching over their shoulders to ensure that things are done right. Internal control has been the primary focus of internal auditors, risk managers, government compliance agencies such as the Defense Contract Audit Agency (DCAA), and to some extent public accounting's external financial statement auditors.

Individuals from outside of this group often view internal controls as a somewhat non-value-adding set of activities designed to ensure that receipts are submitted with time and expense reports and so on. On the other hand, individuals inside of this group tend to look at internal controls as the basic building blocks in the organization and see internal control as a way to help ensure that effective and efficient business processes and systems are designed and operating as designed and intended by management.

What more and more operations personnel recognize is that most internal controls have already been designed into the processes that they operate on a daily basis. In fact, the best internal controls are those that sometimes go unnoticed. For example, automated controls are built into a three-way match process to ensure that the quantity and the price of materials received and paid for matches what is received. Such a control is not generally seen as a burden or concern for operations because it was designed in as part of the logical process.

A systematic three-way match not only improves the efficiency of the process by automating comparisons and field validation, but also enhances the effectiveness of the process. The system was programmed to prevent the risk of a) overpayment for authorized material, b) the receipt and payment for unauthorized materials, or c) the acceptance of excess delivered quantities without any human intervention and decision making.

However, not all controls are as effective as they should be. Thus, operations personnel often rely on exception reports to detect when a process is not operating as designed. For example, a materials management supervisor might review a daily exception report detailing in-bound receipts that do not conform to requirements specified at the time they were ordered. Similarly, an operations manager might monitor the overall activity through a series of monthly performance, variance, and usage reports.

Three types of internal controls were introduced in the last few paragraphs: prevent, detect, and monitor. The Sarbanes-Oxley Act strives to make management accountable for the establishment of sound risk prevention, detection, and monitoring controls over all of the transactions in the organization (*control environment*) that might have a significant impact on the financial reports.

Criteria for Control Evaluation

The now familiar term Sarbanes-Oxley compliance begs the question, "Compliance in terms of what?" As we have already discussed, the specific ground rules for compliance are still unfolding. However, the Securities and Exchange Commission and the Public Company Accounting Oversight Board have loosely specified that the Committee of Sponsoring Organizations framework be used as a basis for management's evaluation of the internal control environment.

The Committee of Sponsoring Organizations (COSO) was formed in 1985 to sponsor the National Commission on Financial Reporting that studied the causal factors that led to financial reporting. In 1992, COSO developed a framework for identifying and managing internal controls. Depending on your perspective, COSO and its framework may never have emerged to have a significant impact on management and other professionals beyond those with the deepest of interest in risk management and internal controls. However, the Sarbanes-Oxley Act has provided the organization and framework with renewed light and an audience that extends beyond finance, accounting, and audit personnel.

The COSO framework is considered integrated because it considers controls that pertain to operations, financial reporting, and compliance. In our three-way match example, all of those controls had a financial reporting impact. Despite the fact that goods were received and suppliers were paid, the purchased materials may have been ordered to a specification that was out-of-date. As a result, the parts may have been incompatible with the higher level of assembly for which they were purchased and therefore caused problems for operations. Alternatively, the parts might have been inadvertently coated with a harmful residue, which may have resulted in the product being noncompliant from an environmental perspective.

So where do we draw the line on internal control? We feel that supply chain and operations executives can move quickly to take advantage of the drive for compliance with the Sarbanes-Oxley Act. Whereas the act focuses on internal controls as they relate to financial reporting, we are seeing more companies taking the opportunity to proactively leverage the momentum and focus the results from the act to reevaluate their entire integrated control environment and to address process, procedure, and transaction controls for supply chain management.

Where this occurs, the response to the act also becomes an organizationwide effort designed to focus on getting back to basics in terms of sound operational process and transaction controls—a foundation for high-performance planning, scheduling, and execution in operations and for the supply chain as a whole. As a result, capability and effectiveness of the fundamental process and transactional controls needed to run a highly successful supply chain are being revisited, defined in many cases, or enhanced.

Additional resources: We explored this opportunity and approach in some depth in the white paper, *“Capitalizing on Sarbanes-Oxley Act to Achieve Competitive Supply Chain Advantage: A Back-to-Basics Approach to Internal Control and Supply Chain Transaction Integrity,”* published on the APICS and Protiviti web sites in 2003.

Conclusions

The Sarbanes-Oxley Act is driving considerable efforts to address process and transaction controls across a wide range of organizations in the United States as well as abroad. In the meantime, the Committee of Sponsoring Organizations has been working to develop methodologies to improve the integrated control environment and create something much more comprehensive.

In addition, the new framework enterprisewide risk management (EWRM) also includes portfolio management, data and technology, stakeholder management, credit risk management, market risk management, business applications, and operations management.

Whereas the development of an effective supply chain management program to mitigate Sarbanes-Oxley risks was the lowest priority in our survey, the development of a formal and effective enterprisewide supply chain risk mitigation process and supply interruption risk management ranked the second and first priorities respectively. Disciplined, well-defined processes and controls are a foundation for effective risk management.

To recap, we can conclude

- 1) All executives, supply chain or otherwise, remain focused on what is germane to them and inherent in their day-to-day responsibilities
- 2) Respondents already feel comfortable with their internal control environment and policies and procedures are consistently applied and well understood
- 3) Respondents do not have a clear understanding of the requirements of the Sarbanes-Oxley Act or its relevance to supply chain processes
- 4) Respondents believe that they are not directly affected by the act now or in the future

Supply chain and operations management may find it to be very much to their advantage to leverage this corporate energy and commitment to improving process and transactional controls (complying with the act). They could focus on expanding the effort to all key supply chain processes and controls, the very processes and controls that form the foundation for excellence in supply chain planning, scheduling, and execution.

We realize that most supply chain management and personnel value the importance of internal controls and place a significant reliance on them daily. It is likely that survey respondents rated this a lower priority because they may not be fully engaged in how Sarbanes-Oxley Act relates to them.

ABOUT PROTIVITI INC.

Protiviti is a leading provider of independent internal audit and business and technology risk consulting services. We help clients identify, measure, and manage operational and technology-related risks they face within their industries and throughout their systems and processes. Protiviti also offers a full spectrum of internal audit services, technologies, and skills for business risk management and the continual transformation of internal audit functions. Protiviti, a wholly owned subsidiary of Robert Half International Inc. (NYSE: RHI), has more than 30 locations in North America, Europe, and Asia.

About Protiviti's Supply Chain Risk Consulting Service Line

At Protiviti, we draw on our deep procurement process knowledge and experience, and our risk and business consulting and internal auditing expertise. We use the most current and proven procurement/supply risk management techniques and tools. We constantly seek to improve our knowledge and to develop and enhance our supply risk management tools and methodologies in conjunction with our clients. We provide independent supply chain and procurement risk consulting services on a project-by-project basis. We also provide such service to our clients through the internal audit channel. We serve clients across the full range of industries. We leverage our in-depth and up-to-date knowledge management database and cross-industry experience to help management at our clients to develop achievable and results-focused action plans for their organizations. These plans address all procurement capabilities in parallel, recognizing the interdependencies among capabilities. What results is an agreed-upon, integrated, and actionable set of short-term, intermediate and long-term plans that help drive crossfunctional and executive-level buy-in and commitment as well as superior business results.

About the Author

Philip O'Keeffe is co-leader of Protiviti's supply chain risk consulting service line. O'Keeffe spent 20 years in supply chain, procurement, and operations management leadership positions in a number of industries in Europe and the United States before joining the consulting industry in 1998. He is passionate about helping clients improve supply chain management performance and risk management capabilities. O'Keeffe specializes in procurement/sourcing, resource planning, scheduling, and control as well as strategic planning. The integrated approach between functional leadership and internal audit discussed in this article is one that O'Keeffe personally experienced and helped develop as a procurement executive at a major multi-national, high-technology company.

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