The Context of Global Supply Chain Security

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Abstract The first goal of global supply chain security is to promote the timely and efficient flow of legitimate commerce while protecting and securing the supply chain from exploitation and reducing its vulnerability to disruption. The second goal is to foster a global supply chain system that is prepared for and can withstand evolving threats and hazards and that can recover rapidly from disruptions. To achieve this, planners will prioritize efforts to mitigate systemic vulnerabilities and refine plans to reconstitute the flow of commerce after disruptions.

Keywords Supply chain management • Criminal threats • Terrorism • Continuity planning • National security • Naval logistics

Introduction

Logistically speaking, ignorance is bliss. Most of us think that stuff just gets from one place to another seamlessly and that when we want a watermelon, it's there for us. A pair of jeans: no problem. Same goes for a computer, TV, car, and most every other want and desire we can imagine.

In fact, the notion of the seamless movement of cargo in all modalities, across the world, is really true. For the most part, at one level, with the exception of war or a terrorist attack, weather, and natural disaster areas, cargo does move from place to place rather easily. General cargo, unlike air express items, moves at a pace compatible with the modality, the length of travel, the girth and weight, the point of

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origin, and the degree of transport scrutiny. From what we see as consumers, the items are almost always available wherever and whenever we may wish to purchase them. Still, there is a lot happening behind the scenes, which is the basis for this introductory chapter.

The Disruptive Elements of the Global Supply Chain

There are three disruptive elements to the global supply chain that can threaten its security: natural disasters, acts of war or terrorism, and theft and domestic labor strikes or shutdowns. Each of these can be compounded and exacerbated by any of the others, and all of them can potentially occur at the same time. Further, any one of these events can bring a country or city to its knees and cause economic chaos, financial losses, or physical hardship on a national scale.

The failure to advance commerce by the movement and delivery of goods and services is the single biggest economic disruption possible in a free market and world economy. Looking at the possible ramifications from a disruption in the supply chain can send chills down the spine of any product manufacturer or service provider. From the terrorist prospective, an act of economic terrorism or, loosely translated, a weapon of mass effect is or can be more devastating than a bombing. When terrorism is involved with supply chain disruptions, the net effect achieves the goal of the perpetrator.

The lack of component products, raw materials, and processing materials, combined with no packaging and/or labor availability, can bring the economy to a screeching halt. Such is the downside of any significant disruption in our commercial supply chain. Isolated issues are the norm in viewing business planning in connection with supply chain problems. Rarely are the issues so significant, outside a war, that preclude reasonable remedy to the problem in the form of rerouting or other means of recovery. Weather is a prime example of an isolated disruptive force. Port strikes, airport closures, overseas supply chain incidents, terrorism, and many other issues typically occur in some locality and do not close down alternative routes or means to recover business operations.

Further, if we look at supply chain security through the prism of natural disasters, we can more easily accept the sudden lack of goods and the resupply concept of food, clothing, water, and basic necessities.

Take Hurricane Katrina, for example. Even with the confirmed prior knowledge of the impending storm, proper logistic protocols still were not established or preplanned. No one seemed in charge. No one created nor set in motion an action plan that involved logistics, until almost a week after the disaster! Supply lines were cut off, repairs were not readily possible, and governmental leadership at both the federal and local levels was stifled and mired in domain issues, red tape confusion, and bureaucratic turmoil. Amidst the confusion, supplies were readily available but inaccessible. Routes for vehicles, as well as some air and rail lines, were closed. Those left in the affected zone were helpless in getting the necessities they needed

for many days. 9/11 was also a tragic yet isolated supply chain issue. That event shut down airports and crippled New York City for months. Emergency procedures were installed, post 9/11, in the city that precluded the seamless entry of materials by truck and rail into the NYC area. The slowdown of materials entering the affected area was tantamount to a second disaster.

Vulnerability to our logistic system unfortunately is vast. It not only deals with the domestic supply chain, and because we are so dependent on foreign goods and raw materials, disruption abroad can cause chaos here at home as well. We have made significant strides in deterring terrorist issues that adversely affect the domestic supply chain but remain helpless in any natural disaster.

Dealing with natural disasters has always been seen as a more regional issue, where help can be brought to bear to hasten recovery, save lives, and to provide aid. Regional disasters such as tornadoes or floods are, for the most part, a known regional issue, and most areas prone to these issues are prepared. They have adequate building codes, typically appropriate and trained teams of managers and first responders available, and they are familiar with the issues surrounding these disruptions.

In acts of terrorism, however, planning must be more contingency based, which involves planning at a completely different level both here in the United States and abroad. Because of the sophistication of logistics as a science, most businesses have adopted just-in-time (JIT) philosophies on inventory and raw materials. Many larger manufacturers pride themselves in having multiple nondependent overseas suppliers, routes, and redundancy. In critical situations, it is hoped by risk planners that no two of these backup systems will fail simultaneously. Although they may have adequate distribution and storage centers, many manufacturers still rely on imported or pre-manufactured goods, arriving when and where needed to maintain production in the event of a disruption. In that business model, many disregard disruption as a part of doing business, but don't be fooled there is no complete answer and no one single silver bullet remedy to avoid all forms of supply chain problems.

Food, for example, fits that picture by necessity, and so many other manufactured and retail goods rely on JIT inventory processes to keep their factories or stores in operation. Since non-processed food is the most significant product adversely affected by a supply chain disaster, retailers are powerless to recover when food is their main product. Besides quickly using up staged food products, no one can remanufacture it! Logistical remedies are not typically applicable to the recovery of these products; hence, supply chain disruption instantly, and adversely, affects the costs of food products regionally and even at times nationally based on the origin, location, and magnitude of the disruption. Issues such as a strike or road closure can cause food to be unnecessarily and possibly inappropriately stored. The fact that storage conditions can adversely affect the efficacy of pharmaceuticals, cause food to rot, and create lag times in further processing is also a major set of vulnerabilities when providing risk-based planning for manufacturers.

Insurance has always been the go-to answer for problems in the supply chain. To say "no worries, I'm insured" used to be a viable and at times successful remedy, however, not so today. More insurance providers require special coverages for each potential mishap in the supply chain. These special insurance conditions rely on a

crystal ball analysis of the "could-be" possibilities of supply chain issues. Needless to say, one could never predetermine what may happen to the goods in transit; hence, protection methodology such as insurance rarely is a viable or effective remedy to supply chain losses.

The Scope of the Global Supply Chain

The commercial supply chain incorporates all transit modalities. Goods of all kinds move by truck, rail, sea, including barges, and air and often in combination among these methods. The commercial supply chain is affected by any condition that causes delays in moving people and materials. It has hundreds if not thousands of internal operating elements comprised of logistic companies and their physical assets, local and national governments, laws, tariffs, and energy and fuel providers. Millions of people and infrastructure including roads, bridges and tunnels, rail, waterways, ports, airports, and rail lines all are required to work in concert to create the supply chain. The international supply chain is the backbone of business and the heart of the world's economy. Our domestic supply chain affects the world market, the financial stability of many countries, the ability of our armed forces to function, and our national economic stability. It is the single most important element of any country, because without it, everything comes to a screeching halt. Each and every factor from a country's ability to function to its economic core relies on a functioning commercial supply chain.

During each day, somewhere around 38 million major cargo shipments and 75 million courier shipments begin and end at our doorstep. At the same time, well in excess of 50 million commercial cargo shipments begin and end in this country each and every day.

As consumers, we take in air cargo as a matter of course and welcome the couriers and drivers as they deliver products to us. Little consideration is given to most of this cargo, specifically, where it has been, who handled it, who shipped it, is this the same generic box that was tendered to the courier, or the fact of the relative safety of its contents. We just sign the form and take it in! The same goes for companies whose shipment is considerably larger and whose items typically move by truck, yet the system is the same and the complacency toward receiving materials is replicated everywhere.

Air cargo, truck cargo, and containerized freight are neither safe nor secure while they are in transit. In most cases, the contents are implicitly safe but there are no guaranties. Typically, what people say is in the box is recorded as such and accepted. Cargo or small packages tendered to commercial airlines at counters do get screened, but at what level as compared to baggage or palletized cargo?

Speed is both the benefit and risk of air cargo! Air cargo, as compared to all conventional forms of transit, gets its greatest security boost from delivery speed, but anonymity of the true contents is the risk. The supply chain for air cargo also incorporates the cold chain system where millions of time- and temperature-sensitive

items move worldwide daily, each with the critical element of speed being the factor which determines the need for air freight.

Air cargo rarely sits still. Cargo at rest becomes cargo at risk from a storage and theft prospective. Any logistician knows that vulnerability, but yet air cargo gets far less scrutiny than we would like to insure its integrity, both aboard commercial aircraft as well as air cargo freighter aircraft. Inbond facilities are notoriously suspect for true long- or short-term containment or control thereby placing another bug in the seamless supply chain. The known shipper program, as it relates to bulk air freight, has begun to identify consistent air cargo shippers, and it has radically and positively contributed to air cargo integrity and security. Serious delays can result for shippers who are unknown or noncompliant with new air shipping regulations.

This risk of delay or theft and the subsequent possibility of loss for air shipments should be a focused area of concern for all corporations. Government regulators, in an effort to secure our supply chain, have created hundreds of new laws and requirements on air freight which, if a shipper is unfamiliar with them, will delay and disrupt what would otherwise be a fast and secure method of transport. Everyone dealing with air freight or courier cargo needs to establish a transfer inspection protocol to insure the goods are actually being moved and not stuck in a warehouse or a customs facility because of documentation or other glitches in paperwork. The risks of a significant supply chain disruptive event, by air cargo, are enhanced by world events. They are not limited to bombs but rather to the gambit of possible problems, which include bioterrorism, drug traffic piggybacked in your containers or courier packs, and cargo pilferage. Each event, regardless of location, can shut down the air freight system, worldwide. Any event can be the basis of shutting down your supply chain without notice.

Domestic truck and rail shipments also pose an equally serious problem should a domestic or foreign disaster issue stifle the ability to move freight. Whether that problem is across state borders or across the world, the commercial supply chain will suffer until remedy can be found and implemented. In fact, no modality is risk free, and since all logistic operations involve some choice in the mode of delivery, the supply chain becomes the single greatest economic target for terrorism.

The Concept of Global Supply Chain Security

Supply chain security is more of a concept than a condition. No one can foresee unexpected disruptions nor can they be planned for. The precariousness of loss free shipping has always been part of the logistic planning function, but with today's manufacturing being more often JIT by nature, logistic losses and delivery disruptions play a far bigger role in the effectiveness of a company's profitability than ever before. Vulnerability for loss is a constant threat to any cargo, whether attended or unattended, monitored or not. Proper planning prevents the obvious conditions such as weather-related issues, suspect route choices, weekend moves, or storage or basic damage issues. But true supply chain security needs to be a coordinated effort among shippers and carriers and in a way must also rely on just luck.

The commercial supply chain is no more secure today than 20 years ago. The dynamics have changes and yet the processes of protection have not. Moreover, supply chain disruptions occur because most shippers and carriers fail to dedicate the proper resources to loss mitigation at the outset so as to reduce risk through technology. One of the technologies adopted to track cargo and the vehicles that move it is called telematics. It is more for equipment efficiency than security, more as a real-time logistic planning tool than for loss control, and surely oriented more toward the carrier than protecting the products or the shipper. Collaterally, shippers benefit from speed, better routing, and up-to-date information on loads, but statistically, losses in theft have remained a constant for the last 35 years and other losses in the supply chain are rarely remedied by these instruments. Theft losses, for example, in the domestic commercial supply chain average more than $20 billion annually, but the caveat here is in understanding losses and their ramifications which make that figure grow 8–10 times. Theft losses are a known condition. Many companies tolerate as much as 3 % of their gross annual sales through theft-related losses. Other commercial supply chain losses through other conditions seem to be unplanned for and therefore do not hit the balance sheet as anything other than write-offs. Theft, of all the perils to shipped cargo, is the only known condition of loss that you can count on as a corporate bean counter.

Losses through supply chain anomalies are never limited to the tangible product itself. The inability of the seller to replace the goods to the buyers in a timely fashion, combined with the logistic, insurance, and administrative costs of the loss, makes the issue of theft, damage, delay, or disappearance a far great detriment to the economy than one may see at the surface. Once you recognize that the loss is not limited to the seller, you can see why clients have to hedge their bets when goods go missing or are delayed. The inability to manufacture a product because of stolen or missing components reeks havoc with global supply costing millions in labor and creating logistic nightmares in replacing it. When goods are not manufactured on time, they cannot be shipped. However, boats and planes don't wait, and therefore, cargo losses mount exponentially.

Brand equity is a constant problem with supply chain disruptions. Lost, damaged, or stolen goods quickly appear on global markets, in Internet sales companies, and at flea markets, worldwide. For example, losses of goods from anything from an earthquake to a super storm are going to be recovered by someone. That someone will then own the goods in question. That new owner can be an insurer, a salvage company, or anyone for that matter. Once recovered and now re-homed, these goods can be sold again in direct competition to the original owner. No longer can the original owner control his brand, his sell price, his distributors, or any other factor indigenous to his business. The loss of a retailer's margins and a brand owner's ability to control his supply chain, based on these goods being recovered or free astray in the market or stolen and now having a zero cost base, makes for tremendous losses for all concerned.

Recovery costs are also a concern. Many companies employ security personnel on a global scale to attempt to recover lost or stolen goods; however, they are rarely successful. Even if by chance they do stumble on a truckload of a product, its return

to the market becomes precarious and costly. If it is a product that is now out of season or date, recovery is almost meaningless because the item cannot be resold. If the item is an ingestible, recovery means a complete reversal of insurance payments, if any existed, causing the company a second compounded loss of revenue.

The Likelihood of Global Supply Chain Disruptions

Most people can come up with their own personal scenarios on disasters, which disrupt the global supply chain be they man made or natural. If you put 100 people in a room and ask them for three ways they could disrupt life as we know it, you will likely get 300 quality scenarios. Given that these folks probably have never had such ideas beforehand nor would they ever consider acting on them, you can only imagine what terrorists could conceive of. Supply chain disruptions or, as mentioned, these weapons of mass effect are extremely dangerous and possible. Because threats to national security are ever-present, our government has taken steps which they feel would best serve to deter the bulk of the most simple and common issues and thereby focus on the percentage of issues that are not only more sinister but require a more dynamic plan and more people to carry it out. Natural disasters need no such sophistication and can happen anywhere and at any time.

The global supply chain takes into account far more elements than simple domestic logistics. Countries have varying degrees of sophistication in all areas of transportation and consequently differ in efficiency, preparedness, adaptability to issues, and transport options in the event of a disruption. Customs processes and local laws affect supply chain dynamics. Based on their degree of implementation, corruption, and sophistication, goods can spend inordinate amounts of time being processed, inspected, or scrutinized or simply be passed through willy-nilly.

The Local Approach to a Global Issue

From the borders of African nations and Middle Eastern nations to the volume of goods from the EU and China, products travel in very different ways, with totally different documentation, protection, inspection, and efficiency. There is no global road map for supply chain security, and there is surely no consistency. From the natural disaster prospective, what happens in the smallest country can bring a world economy to a screeching halt.

Countries adapt to their surroundings and cultures. The nature of supply chain consistency and security on a global scale is haphazard and relies on basic business principles to work. A small country whose supply lines act as a choke point to other countries or critical ports can create a nightmare if that country has no funds or the ability to repair roads, bridges, tunnels, or ports based on the nature of the disaster. International aid can take weeks thereby causing irreparable harm downstream.

In the United States, the Department of Homeland Security (DHS), Immigration Customs Enforcement (ICE), and many other agencies have some role in protecting the nation by overseeing the global supply chain. Their orientation however is physical security. These agencies could care less, by design, that one company's cargo is being held for a container screen, or the ship carrying a company's cargo is being delayed coming into port due to some contraband being found on board. Disruptions can come at anytime and anywhere, caused by the laws designed to protect us! That help provided by national policy to protect us can be counterproductive to the supply chain. Additionally, supply chain disruptions outside the United States based on counterterrorism vary drastically. These efforts, through having a common core, are also frequently the cause of cargo delays.

Programs have been established at tremendous costs to both the government and industry and still do not address the problem globally, leaving us almost as vulnerable as without their implementation. Many of these laws focus on air and sea transportation, while others shore up our borders against over the road issues. Some of these programs include C-TPAT (the Customs-Trade Partnership Against Terrorism), TWIX, BASC, and Known Shipper, but these types of programs are now worldwide and some are stronger yet many are weaker but none are the same or seamless. Shipping worldwide has become far more difficult and complex since 9/11.

Each new law for protection against terrorism addresses what we cannot control through our own logistical processes and personnel, yet since each country has a different set of standards, shipping goods can be more costly and more complex. As an example, if a company has a specific pallet they use to ship goods from their suppliers, because it fits their mechanized system, they need to be certain that the origin countries allow for that size or pallet material is permitted. China, for instance, does not allow certain woods to be used as pallets. A shipment of baby powder from a plant in Columbia would get through their customs with simple documentation and land in the Port of Newark by ship in a few weeks time. Once it arrives, however, the anomalies of powder shipped by sea freight coming from Columbia would trigger vast inspections at high costs and with radical delays. It would then be off loaded and moved by truck to an inspection plant and would require special oversight to be released. A shipment of the same goods from a facility in New Jersey traveling to Mexico, for instance, would be screened, inspected, and approved at least three times before it crossed the border thereby making it easier to export the material than to import it.

The Notion of Vulnerability

The vulnerability of our supply chain is vast, and yet the reliability and resilience of it exceed that of any other country. It seems that in spite of Mother Nature's wrath, and notwithstanding the possibility of another terrorist incident or theft, we seem to pull out all of the stops to return ourselves to life as usual and achieve normalcy quickly and efficiently.

Is the global supply chain as secure as it could be? Have we planned for all of the potential disruptions? What can we do to improve our ability to recover from supply chain problems, and what are the commercial and governmental ramifications of longer-term supply chain interruptions?

These are all questions that every company and government must answer. Whether they are manufacturing, importing, or exporting, regardless of modality or supply speed and regardless of the nature of the goods shipped or received, supply chain disruption planning is mandatory as a planning tool. The paradigm of ignorance is bliss has no place in logistical planning.

The nation's road system is both a federal and state responsibility. When issues threaten the viability of the road system, for example, action needs to be generated in such a manner that repairs are effectuated within reasonable time frames. Empirically, this concept seems logical and workable. However, as we have seen time and time again with natural disasters, confusion becomes more of the rule then anyone would prefer. Ownership of the responsibility can only work if planning has already taken place wherein each party knows their responsibility and each party, including local, state, and federal, has the infrastructure and resources in place to address the problem.

Our roadway system is the single most vulnerable entity in the supply chain, and it goes without saying that any disruption to it, anywhere in the nation, can dramatically and exponentially affect the nation as a whole. Because the Federal Interstate Highway System has no real form of protection, it is easy to see where any breach can slow down or shut down vast sections of the country dependent on that particular route.

Savvy logisticians consider supply chain routes in planning materials movement. Many truckers also evaluate route and distances for both cost savings and against vulnerabilities such as hijacking, theft, stopover points, drop trailer lots, and driver distances to mention a few considerations. Most shippers fail to consider these vulnerability components, while truckers and third party providers rarely look at supply and resupply issues in the event of a catastrophic event. The combination of initial supply and resupply is tantamount to a total supply chain plan.

There are no quick fixes for downed bridges, highway roadway surfaces, and tunnels. These fixes require time, and time is the logistician's enemy. Because of this, many security and safety recommendations by the federal government have been proposed, but few actually have been implemented and even less have become law.

Regardless of the supply disruption, the downside of the failure of any infrastructure element wreaks economic havoc on a national scale. Repairing such a problem also presents a formidable challenge. Rerouting changes the delicate balance of major and minor roadways, it disrupts traffic patterns causing even more burdens on smaller communities, and of course it increases operational costs at every level. The time it takes to repair roadway issues and the burden of cost taxes the ability of the states affected in a myriad of ways. If the disruption was terrorist based, repairs may be a far more arduous task since there may be more involved with security than with a natural disaster. The elements of the state and federal government charged with repair can also vary where funding and resource allocation may be concerned.

Approaching Global Supply Chain Security Vulnerability

Businesses whose processes involve shipping and receiving goods through every modality, and those who provide the logistic services, need to coordinate and explore both short- and long-term fixes when and if a disruption does occur. In most cases, these discussions are met with tremendous resistance by all concerned, as there are no fixes that don't involve unseen expenses, major changes in operations, dedicated personnel, and higher costs. Backup plans, however, are far less costly when documented in advance, practiced, and funded and accepted as a cost of doing business on a large scale.

Supply chain disruptions can be couched as an expense or as a component of manufactured costs. Backup materials vs. JIT supplies can almost be seamless in certain operations where there are contracted buffer storage facilities available, where multiple shipments are scheduled in at a faster pace for seasonal production, or where more on-site inventory is acceptable. Of course, certain operations do not lend themselves to these alternatives, and, therefore, these businesses will be far more negatively affected by any supply chain disruption.

Globally, terrorism is a real and omnipresent way of life. The instability in the world increases daily where there is little remedy and even less deterrence. Our government and most of the world's governments have seen these issues first hand. Each has unto themselves proposed and adopted a plan of addressing both deterrence and recovery, yet each plan on the world stage is still disjointed. In many cases, these plans are unrealistic for the country to implement and uncoordinated among other trading partners leaving undetected and inherent weaknesses to the world supply chain in direct opposition to the core idea of security.

The United States created numerous agencies and internal departments to address infrastructure recovery and basic supply chain security. These groups now account for 500,000 new employees, doing their interpretation of the overall mandate. It is difficult to determine how the lines are drawn since overlap is the nature of protection. Agencies such as ICE, DOE, DOS, and DHS and the FBI, SS, NSA, and CIA all have their fingers in the pie, yet coordination between them is sparse and at times nonexistent. Laws have been passed that give each partner certain mandates such as the creation of the CCSP by DHS, the TSA also by DHS, the Patriot Act, and the C-TPAT. Many of these laws and recommended best practices have become more burdensome on businesses than effective preventative measures. Business needs an equilibrium between security and expedited movement of cargo, yet government requires consistency regardless of the effectiveness of the practice. These two conflicting paradigms provide the basis for ineffective and cumbersome requirements that are now unfortunately crucial elements of business logistical planning.

The instability in the world has spawned new business opportunities in security globally. Millions of people in almost every developed country are now dedicated to inspecting cargo, passengers, trucks, trailers, sea containers, and ports. Governments have developed new agencies, manned by untold thousands of personnel, whose job is to monitor cargo, develop new documentation, secure border crossings, oversee

warehousing and drop lot operations, and many other ancillary functions needed to close the loop against terrorist issues. The regulatory functions needed to develop and monitor systems used to protect the supply chain and commercial travel have their own bureaucratic challenges. This is a new global concept, and therefore, it runs in the face of each nation's beliefs, assessments of risk, and fiscal ability to fund, carry out, and enforce the functions created independent of one another. Although terrorism has raised the awareness of the possibility of economic collapse on a global scale, many countries are just incapable of participating in the remedy, which renders the entire system vulnerable.

Planning for Supply Chain Disruption

Planning for supply chain disruption is by no means easy. The smallest issue can be devastating to a business. Many companies however fail miserably to have even basic contingency plans in place when problems arise. Even relatively simple issues quickly become encumbered by the lack of preprogrammed remedial actions needed to address the problem. As a basis of operating a global corporation, every company should have a crisis management team which is made of empowered personnel. This team should be well organized and funded and should be in place and well practiced in order to be effective in the face of an emergency. Many national companies, even today, fail to actually have such a functioning system in place. In order to have your best chance of minimizing recovery costs, preparation and true risk management must be at play. This team should have appropriate personnel in place that span the gambit of all functional business operations and the bandwidth to unite in the face of a crisis from global points by some preplanned communication method. From human resources to supply chain assets, from logistics to physical property and inventory, and from quality assurance to manufacturing, no sector of business can be left out of the recovery equation. No business can recover from a massive disruption without all aspects of the business's operations being in the loop.

Planning is a key component in any business. Updating planned efforts that change with the times and nature of business operations makes these refined plans even more effective. Whether you are a manufacturer or a service provider, you need to be able to sustain operations, seamlessly, when these disruptions arise. Inventory levels provide some ability to limp though disasters, but most companies today work on very tight inventory programs and in most cases these buffers are only a short-term fix. While most clients understand when operations go down, they too may have backup plans that do not include your company's ability to recover but rather immediately switch business to your competitors. Regional operations with multiple common manufacturing locations typically fair the best in major disasters or disruption issues as materials and production can be switched from plant to plant. Single-source operations, which account for the vast majority of manufacturers and distributors, bear the brunt of losses due to supply chain problems.

Because the costs of losses can be so significant to a business, developing a metric-based allocation system is a great idea for logisticians. This matrix must include basic and future costs of loss while accounting for immediate- and long-term remediation and recovery costs. Because there are hundreds of categories of these costs in any business operation, placing them in order of significance is a daunting task. Each business is unique but certain tenants of operation are common, and these tend to be the first to be addressed. No business can operate without its human resources; hence, having people on- or off-site is a key element of recovery. Physical manufacturing or distribution locations tend to be high on the priority list as well, since without a location with which to operate, not much gets accomplished. Infrastructure is also a key element, but in many cases, once a disaster has happened, getting power, fuel, phone, and Net services is often out of your control. Materials, records, computer backup for operations, and machinery also round out the recovery plan.

Taken as separate components, each of these elements has their own inherent and independent issues. Taken as a business entity, their collective interaction provides the list and the ordering of recovery priorities. No list is ever stagnant, and no order of priority can exist without first having the disruption identified in order to determine what's working and needed and what's not. The supply chain is delicate. A trucking or port strike, for instance, can back up shipments, reduce available manufacturing components, and bring a business to its knees without affecting a company's ability to manufacture or perform their service. Disruptions overseas ranging from acts of terror to strikes can affect certain areas of the world without notice. Wars can create tremendous demand for certain goods which is clearly the opposite effect but no less traumatic to the supply chain.

Keep in mind that management serves both the day to day and the planning function for a business. Without both being addressed, management is not accomplishing their mission and therefore weakens the long-term prospects of the company.

The supply chain today has really not changed that much in the past 20 years. This takes into account roads, ports, rail, barge, and air transportation. We have somewhat more regulation geared toward security in place, somewhat more physical scrutiny for cargo, and somewhat better infrastructure, and yet not much has changed with regard to reducing or eliminating risk. Risk is not mitigated by insurance because, realistically, one cannot ever fully recover a loss. Risk is reduced by planning but, because of the dynamic set of possibilities, only to a small degree. Risk is an ever-present condition, and yet threat assessment is typically a second rate business function.

The Rising Importance of Security Within the Enterprise

In the recent past, security departmental functions in major corporations have morphed from having a greater say in operational planning to a role of physical (on-site) monitoring. The function has moved from a corporate line function to a dotted line from human resources. This seems to exclude the practical nature of having a security department in the first place much less a true risk management group!

Security in a corporate sense used to be comprised of physical on-site security, meaning gates, employee vetting and screening, lots, facilities, guards, and access controls. Next came issues of theft, industrial espionage, counterfeiting, diversion, product recovery, logistic oversight, and protection. Finally, security played a consultative role in business disaster planning and risk assessment. The use of these talented individuals seems to have all but disappeared, and it seems this is due to a misunderstanding of their cost vs. their benefit to business health. Without some basis in threat assessment, planning for supply chain disruptions is more of a guess than a metric- and expertise-based function.

Logistics is the only element in a business where secondary planning can be useless as a remedy because with no way to move goods in or out the business is at a standstill. Materials in any product business must be turned. Products must be able to get to their destination in a timely and safe manner, and without this logistic cycle, no sales can be recorded, nor profits made, nor clients satisfied, nor personnel working. Without a means to accomplish the mission of a business, there simply is no business.

Military Logistics as a Role Model

The challenge of planning for the unknown is daunting but possible when you prioritize issues and have the resources and flexibility to respond to sudden unpredictable situations. Once such place where supply chain disruption is the norm is military logistics. In the world of the warrior, nothing is fixed and nothing is out of the question. Military logistics is by definition the backbone of any military strategy. Without supplies, a military action ceases to function. Without contingency, planning response times become life and death situations. Unlike corporate logistics, military logistics utilizes all modalities and then inter-disperses them, at a moment's notice based on real-time issues. Unlike in the corporate world where all moves are subject to conditions, vendors, and costs, military moves are rapid responses. Unlike in the corporate world where a container of goods may in fact be the only one of its kind in the supply chain, military cargo must, by its nature, have double and triple redundancy in order to insure mission compliance. Items such as uniforms, ammunition, food, vehicles, and medical supplies must be able to be deployed wherever in the world they are needed. Military planning allows for dozens of contingencies and does not rely on one's ability to pay to have items remade or moved when and where needed. The world of military manufacturing and logistics is the epitome of disaster planning.

Besides being dynamic, military logistics is also disjointed. There are multiple branches of the military, intelligence community and defense contractors. Each element has its own mission and each typically has its own logistic operation. Many times, missions overlap as in a war or conflict zone, but many of these day to day operations are focused on that branch of service and their unique operation and asset base. The nature of the needs of the military is indigenous to each branch and even down to each operation in any theater worldwide. Let's face it, the Navy does not

wear Army uniforms nor do they need the same ammunition or employ the same tactical assets. Suffice it to say that moving supplies of every category and description into a military theater is a tremendously complex operation. If we in the corporate world think we have vulnerabilities and supply chain disruption, well think again! As compared to military logistics, even the worst disaster is a walk in the park when you are fighting a war.

More so than any corporate function, defense asset logistic needs trump any possible contingency ever encountered by any business.

Like businesses, defense-based assets need to be where they are supposed to be when they are needed. Delays in receiving assets can cost lives, and the importance of accuracy and reliability of the supply chain is crucial. Businesses have different requirements that to them equate to life or death situations. Goods delayed by supply chain disruptions can become obsolete or unusable based on the commodity and the amount of time required to complete the move. Cargo that is stagnant requires special protection. Temperature-controlled cargo requires monitoring, and in many cases, trailers or rail cars left in staging areas can become vulnerable to theft and damage.

There was a time, not so long ago, that we just didn't seem to worry about supply chain disruptions. It was not that we were invincible but rather naïve. We had plenty of materials in the pipeline, we made the vast majority of goods here in the United States, and we really didn't concern ourselves with disruptions other than those occurring naturally. In today's reality, we have a variety of concerns above and beyond what was considered the vulnerability of the supply chain. Here to for issues such as domestic and foreign terrorism were not considered eminent. Issues involving cargo theft was alive and well but considered immaterial to the normal operations of business and even the government. With an excess of 25 billion dollars stolen annually back then and even now, the focus and the understanding of its effect has only recently been a topic worthy of the board rooms.

Supply chain disruptions can involve any condition that creates a void in the supply chain, and since each disruption adversely affects other aspects of logistics, even the smallest glitch can have a major impact downstream.

A Five-Step Process for Asset Recovery Calculations

When doing disaster planning, the steps and considerations mentioned below will tend to focus you on the right track.

The Five-Step Process

1. Identify risk exposure.
2. Measure risk with known metrics and intelligence estimates based on the probability of the occurrence. Consider the financial impact of the loss and evaluate protection costs based on the ability to predict or deter the occurrence.
3. Consider how your business continuity plan enables you to recover after the loss or supply chain disaster and decide on the most appropriate defense.

4. Fund and implement solutions in their order of importance.
5. Monitor and measure the effectiveness of your planned solutions and update them over time.

Knowledge has always been the key to business continuity. If you know your business, you understand your threats to profitability, and your corporate culture permits contribution by all affected business components, you will find the road to recover after a significant disruption to your supply chain easier and less painful than "on-site planning." No one can foresee supply chain incidents such as naturally occurring events or terrorism, but you can develop and refine a plan for remedy in the event of some such occurrence.

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