

AN EMPIRICAL STUDY ON SUPPLY CHAIN SECURITY, IMPLICATIONS & METHODS FOR PREVENTION

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Abstract—Supply Chains are inherently complex, dynamic and fluid, characterized by uncertainty, ambiguity, and friction. These characteristics darken the operating environment and create risks. The concern about security of supply chain among all domains globally is creating a need for everyone to practice security procedure in supply chain to maintain a continuous flow in the process.

I. INTRODUCTION

Application of policies, processes, and technologies to safeguard supply chain assets - from theft, vulnerability or terrorism and to prevent the unauthorized access into supply chain is termed as supply chain security management. The path will provide organizations with an improved and enlighten supply chain security, as well as help in raising the baseline level of competence in this regard, through the continuous adoption of good practices. This guidance has not been drafted for the organizations with national security (high assurance), requirements but for the organization who need it.

Most organizations rely upon vendors/ suppliers to deliver products, process, and services; this is how we do business. But, supply chains can be massive and complex, involving many vendors/suppliers involved in many different processes. Essentially, securing the supply chain can be a difficult task as defenselessness can be intrinsic or identified and exploited at any point

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in the supply chain process. A susceptible supply chain can cause damage and commotion. Even though these risks are huge, many companies mislayprospect of their supply chains.

Security - its demands and restrictions constitute hindrances (reasonable and somatic barriers) in the flow of supply and distribution. These “barriers”created by a superficialincreased need for security, or political reasons has reduced the reaction capacity and the physical and economicalrecital of the company. Assimilation of the security facet in the logistics strategy has made the organizations and its operations to become a new defy for supply chain management. The recent security concerns have led to the expansion of numerouswits and impending solutions to enhance security in international supply chains without affectingadeptness. Industries, governments and researchers embark upon the problem from different standpoints and by using several approaches. Though there are inherentcomplications such as the large quantity andassortment of the actors.

Entangled international supply chain proceduresand the requisite to recognize cost-effective security actions, have stimulated multiple speculative/ academic research questions in the realm of SCSM

II. Threats for supply chain

Below are the few threats affecting the supply chain globally:

- *Theft/Pilferage*
- *Competition*
- *Information Systems*
- *Cell Phones*
- *Thumb Drives*
- *Camera Phones*
- *Disgruntled Employees*
- *Lack of Training*

Supply Chain Threat — Cost Volatility

The final price of merchandizing that the consumer pays can be affected by the mutable costs of each part or material that plays a role in its manufacturing. From reliance on the oil to fluctuating costs of raw materials liable on the season, erratic costs can cause major interferences in the supply chain.

Labor Issues –

Labor is the prevalent capricious cost within a warehouse. Changes in worker wage agreements or increase in the minimum wage level can bring the cost of products plummeting. A strike or other significant work slowdown can occur at any time, and bring the supply chain to an absolute cessation.

Cyber Security-

Preventing cyber intimidations to the company may take some extra money, but it balances the costs and reputational damage of getting hewed. The brands being damaged in consumers' minds, huge financial losses, and executives losing their jobs, non-amenability can have a huge impact on a company. Every single association with the business along with the supply chain need to be vetted to ensure security

Legislation & Compliance-

Supply chains are required to be more acquiescent to environmental and safety laws than before. The FDA and EPA, midst many other organizations, can impose penalty on businesses for profoundly deteriorating in comply with strict laws. Businesses have to worry about statute abroad too if they want to produce or sell their products there.

Man-made Disruptions-

Political unrest, chaos, and war can have a remarkable impact on supply chain resulting in diverting shipping routes and even restricting parts and products from reaching their destination. Natural Commotions-Whirlwinds, earthquakes and other natural calamities and all in between can be a primary disparaging force on supply chains. Natural tragedies can foray without notice and takedown substantial areas within a company's supply chain, bringing production to a halt.

Implication due to supply chain breaches

- Surplus costs
- Time to market/Product launch delayed
- Product quality threatens.
- Business lost
- Damage to brand reputation
- Fines and legal liabilities incurred

The point revealed above are the foremost resultant if we lack anywhere in supply chain. If any of the issue get rehabilitated then it will affect the complete supply chain. All the results mentioned above are the backbone of any process, hence, if we miss these then our process is not lucrative and there will be many other related issues which can damage business enduringly. So any organization must keep a watch on these effects of bad supply chain to maintain the quality of their product and sustain in the market for long run.

Methods to secure supply chain process

- **Empower your trading partners-** Institute a collaboration platform and communication framework designed to facilitate information exchange, with cost cutting and reducing errors.
- **Vendor assortment in various sections who supply through ancillary ports-** continuation a varied base of suppliers even when equivalent materials are available from suppliers in the same region will benefit when one country experiences a commotion.
- **Fully engage in supplier relationships-** There is need to rely on them for help if disruptions arise, monitor suppliers for any potential problems.
- **Recognize and evaluate current risk-** Enumerate and prioritize risk, and then develop a mitigation strategy. Start regressive from the customer and measure the revenue impact of supply chain commotions. Follow that trail through the manufacturing cycle to the potential sourcing or logistics constraining factors.
- **Recognize supply and provision alternatives-** Build concerted relationships with primary and secondary suppliers, and know which suppliers characterize the best marginal sources.
- **Take control of logistics processes-** Instead of abdicating to the suppliers' delivery, bring items closer to home where it makes economic sense, and globally source where savings

are balanced by assurance of supply. It is decisive to take ownership of both the supply and carriage processes to understand the intrinsic risk, unrelated of who has economic responsibility for delivery according to the terms of the sales contract.

- **Jointly plan and collaborate about potential supply chain disruptions**-Include suppliers, logistics service providers, and customers in your collaboration plans. Initiative toward reciprocally available risk plans for each link in the supply chain.
- **Build flexibility into processes in order to promptly adapt changes with minimum impact**-Share forecast and demand information with trading partners so you can be more responsive to customer demand fluctuations. Develop a corporate culture of agility, rather than reactivity. Agile companies can respond rapidly and effectively to manage supply or demand changes.
- **Optimize inventory buffers and safety stock levels**-Make sure you have enough supplies to keep producing
- **Be proactive.** Increase discernibility into supply chain operations, including event management that enables tracking and monitoring of material flow. Incorporate analytics to identify patterns as they develop for data-driven pre-emptive action.

Players of Supply Chain:

Players involved in supply chain are mentioned below:

- Supplier
- Manufacturer
- Warehouse operators and owners
- Transporters
- Terminal operators
- Sea and Freight operators

Involvements of Players of Supply Chain:

- All players have to be involved.
- It involves securing every node and link along the chain
- A chain is only as strong as its weakest link

- Start with safe/ secure packing of a shipment from point of origin to final point of deconsolidation
- It is about secure custodian of cargo at every point along the supply chain.

Major Supply Chain Security challenges:

Major supply chain security challenges are illustrated below:

- Supply chain involves many players
- Multiple modes of transport
- Various types of intermediaries
- Several government agencies globally
- Complexities of the system lead to Challenges
- Security directors need C- Suite Support
- The Human element

Supply Chain Security – Collateral benefits

Efficiency <ul style="list-style-type: none"> •Reduced inspections •Increased automated handling •Less process deviation •Shorter transit time 	Visibility <ul style="list-style-type: none"> •Improved asset visibility •More timely shipping information •Reduced inaccurate shipping data
Resiliency <ul style="list-style-type: none"> •Shorter problem resolution time •Quicker response to a problem •Reduced time to identify a problem 	Inventory Management & Customer Relations <ul style="list-style-type: none"> •Reduced theft/loss/pilferage •Decreased tampering •Less Customer attrition

Study by Stanford University states the benefits as following:

- 11 manufacturers and 3 third-party logistics providers
- 14 companies got more than a

return on their securities investment in supply chain security

- Reduce cargo inspections by 48% average
- Reduce transit time by 29% average
- Delivery times fell by 28%
- Theft, loss of freight and tampering fall by 90%
- Damage reduced by 50%

The Human Element

- Security relies on people

- People perpetrate criminal and terrorist acts
- People are key to preventive measure
- But to make security work, people have to be engaged, be supportive and willing, and see and feel the benefits.

Conclusion

For supply chain officials, the initial years of the 21st century have been distinguished with major supply chain disruptions that have highlighted vulnerabilities for individual companies and for entire industries globally.

It is clear that the SCSM regularization work will continue to be driven by both governmental as well as business societies. It appears that an important part of this responsibility may be shifting to regional and global standardization bodies, such as CEN (European level) and ISO (global level). How to create and manage truly global, enforceable standards for the SCSM, remains an open question for future research, and challenges various decision makers in the field. Also, the whole mechanism from SCSM

Certification to auditing, remains open for the time being, including defining the main responsible government authorities for the process, such as Customs, transport and other authorities. It is evident that multiple expanded and new businesses are emerging around SCSM, while companies from various sectors, including aerospace and defense technologies, security technologies and services, Information Technology and services, shipment inspection and trade compliance services, management consulting etc., are seeking for new business and revenue opportunities. This includes new SCSM technologies, IT platforms, consulting, training and auditing services etc. It remains an open question as to which sectors and partnerships will manage to create the most reliable and cost efficient solutions and services for long-term success in the field. The pricing and financing of security, SCSM public-private-partnerships and other business and fiscal aspects remain a topic for future research.

So as we mentioned some important point above in this presentation that needs to be practiced to maintain secure supply chain.