Strategic analysis of global operations of supply chains

The main objective of this study is to do a strategic analysis of the global operations of supply chain within Mattel Toys Inc. Here its supply chain will be evaluated along with the risks/ security threats it faced and a framework will be presented to manage these risks.

With growing product/service complexity, supply networks are also becoming increasingly complex in the wake of outsourcing and globalization. This has affected risk, changing it continuously. Risk can generally be termed as a probability of injury, hazard, damage or any other unwanted outcomes.” The Royal Society (1992) defined a more systematic explanation of risk: ” the probability that a particular adverse event occurs during a stated period of time, or results from a particular challenge.”

In this study, we will suggest a framework for future supply chain risk management in the view of Mattel’s recall in 2007. This recall left a trail of media reports, public critique, investigations and huge lessons learnt.

Mattel Toys Inc. is a global leader in the design, manufacture and marketing of toys and family products. It comprises of top-selling brands such as Barbie, Fisher-Price brands etc. Mattel is recognized as the 100 Most Trustworthy U. S. Companies by Forbes Magazine. (Source: Wikipedia)

In 2007, it experienced a sequence of continuous alarming product recalls in which around twenty one million toys were pulled out from sale. Whether the toys were defective in design to lose small magnets, which if consumed could harm kids, or they were toys contaminated with lead paint coming from unethical Chinese vendors was irrelevant as the case was subjected to

high media critique and got highlighted for quality mismanagement and varied logistic practices in outsourced vendors. (Biggemann 2008)

The table (figure 1) below shows the toys recalled from Mattel's respective vendors and their sub-vendors:

Industry experts suggest that Mattel is locked in a relationship with China having five factories and manufacturing there for nearly 25 years. It outsources its production up to 50 percent to third-party manufacturers and almost 65 percent of its toys are produced in China.

" In spite of quality control efforts, Mattel has had 36 recalls since 1998 and two formal Consumer Product Safety Commission (CPSC) admonishments. It's most controversial recall, up until 2007, involved 10 million Power Wheels toy vehicles." (Biggemann 2008)

Below is a timeline depicting the key events that took place during the course of this recall,

Figure 2: Mattel's product recall timeline

The result of this recall was catastrophic for Mattel and it lost more than 45% of shares in market value. Although sales at international markets helped it gain some profit for that interval (Casey, 2008), yet these had very little impact on their annual figures as compared to its loss. The question now raised was " How did Mattel end up in such a tricky situation?" Is it a case of heavy neglect or something worse? It is argued that this was the result of Mattel's flawed sourcing strategy.

Literature Review

Toy industry is one of the oldest industries for creativity and extremely volatile in nature. In the United States alone there are approximately 3 billion toys sold per year (Elsasser 2007). Toy sales estimate are nearly 22 billion USD (Strickler 2007). Figure 3 estimates the annual toy sales from July 06 – June 07 which marked a rise up to 22. 5 billion USD.

Figure 3: State of Toy Industry

Erratic and changing demands in this industry create a layer of volatility due to undersized and customized selling-openings and rapid product lifecycles. Toy demand and toy retailers' needs are very volatile and expect toy manufactures to be very market responsive; but most toy manufacturers respond with conventional mass-production strategy which is very minimal in response and very mismatched to their strategy. Supply networks of such industries are growing into complex and dynamic mesh of varying relationships (Harland et al., 1999). Risk is escalating and its focal point is ever changing within the dynamism of supply networks all due to outsourcing of supply operations overseas and also due to growing complexity of product/service life-cycle.

Of late research has explored strategies to minimize risk in toy supply chains and networks. One of the main assets of toy manufacturers is their network position and the relationships and policies that come with these (Turnbull et al., 1996). To asses and manage risks, network positioning plays an important role especially in resource sharing, reputation management and terms of contract (Henders, 1992).

To begin the research, a literature search was undertaken with the intention of locating articles related to supply chain security and risk. The search included all journals known to publish articles related to security, risk, and/or supply chain management. Examination of the literature reveals four core premises that are consistently mentioned as vital for firms seeking to maintain effective levels of security and in minimizing and/or managing supply chain risk.

(1) Preparation and planning initiatives.

A central focus of the supply chain security/risk literature is business and supply chain continuity planning. Zsidisin et al. (2005a) offer a four-step business continuity plan, including awareness creation, prevention, remediation, and knowledge management, thought to be salient for firms needing to protect themselves and their supply chains from external risks. The business continuity planning concept is conceptually aligned with the supply chain risk paradigm, i. e. supply continuity planning by Zsidisin et al. (2005b), who suggest that controlling risks at the supplier level is critical for firms wishing to avoid disruptions in supply lines.

(2) Security-related partnerships.

Another theme found in the security literature addresses the formation and maintenance of security-related supply chain partnerships. Sheffi (2001) posits that leveraging relationships with suppliers and governmental agencies is necessary to ensure against asset and product damage and thereby facilitate supply chain continuity. He proposes that supplier

relationships should be built both locally and globally, with higher tolerance for cost and lead-time requirements, in order to diversify supply risk.

(3) Organizational adaptation.

An additional emergent research focus deals with organizational adaptability as a coping response to potential or realized supply chain risks and crises. The literature broadly suggests that supply chain security-oriented firms take adaptive steps toward both securing supply chain assets and minimizing risk exposure.

(4) Security-dedicated communications and technology.

A final characteristic at the firm level is the implementation and usage of security/ risk-dedicated communications channels and/or security-facilitating or risk minimizing technology. Zsidisin et al. (2005a, b) state that the ability of the firm to manage information and knowledge, and to build continuously on the knowledge base, are imperative conditions for mitigating supply chain risk.

In case of Mattel Toys Inc, risk came from the fact that about half of its toys are made in Mattel plants and about half are outsourced to vendor plants. Some of the problems came in when these vendor plants also outsourced to other vendor plants and again these other vendor plants outsourced, thus, making the supply chain very long – or ‘ deep’.

The longer the supply chain, the harder it is for the foreign firms to keep track of who did what, when and the final quality of the parts or product (Lyles, 2008).

The next section provides a security framework to deal with the past and unforeseen future risks in the complex supply network of Mattel Toys. They are suggested guidelines for identifying, assessing and managing risk.

Theoretical Framework

This section of the essay contains the overarching methodology for dealing with Mattel's situation. For this purpose, the Supply Network Risk Tool put forward by Harland et al., 2002 has been used. A diagram illustrating the entire methodology has been given below. This is followed by a justification for selection, and identification of shortcomings.

(Fig4. Supply Network Risk Tool, Source: Harland et al., 2002)

Justification of the Theoretical Framework

The framework is built on earlier research and consists of individual frameworks for each section, thus evaluating the problem in detail. It provides a holistic view to assess the situation/incident and follows a definite sequence for mapping and implementing risk strategy. For disruption like that of Mattel's recall in 2007 it provides a resilient approach for managing the risks involved in an efficient manner.

Testing/ Expansion of the theoretical Framework

The Supply network risk framework consists of six sections which evaluate the overall situation of the organization in a comprehensive manner, and suggests solution accordingly. During the course of this expansion, Mattel's situation is analyzed and simultaneously the framework is examined and later critiqued.

Part 1- Map Supply Network: The diagram provided below is a snapshot of Mattel's supply chain from beginning to end that existed before the recall in 2007.

(Fig5. Mattel's Global Supply Chain, Source: Barad, 2002)

Identifying Risks

Risks (table 1) within Mattel's complex supply network have been identified.

Strategic risk (Simons 1999)

Definition: Affects business strategy implementation

For Mattel:

New technologies can render their products obsolete

Sudden shifts in customer tastes

kids are getting older younger (KGOY)

toy retailers are consolidating

retail price is falling

Supply risk (Meulbrook 2000)

Definition: Adversely affects inward flow of any type of resource to enable operations to take place; also termed ' input risk'

For Mattel:

increasing customization

outsourcing of operations

disruption to the supplier

quality problems, materials and parts shortages etc

bankruptcy of supplier

Customer risk (Meulbrook 2000)

Definition: Affects likelihood of customers placing orders; grouped with factors such as product obsolescence in ‘ product/market risk’

For Mattel:

Shift in customer buying pattern

Shift in customer preferences

More competitive products during demand

Operations risk (Meulbrook 2000)

Definition: Affects a firm’s internal ability to produce and supply goods/services

For Mattel:

Failed/ out-dated technology

Labour strike

Disasters and Natural Calamities

Reputation risk (Schwartz and Gibb 1999)

Definition: Erodes value of whole business due to loss of confidence.

For Mattel:

Recall history

Financial risk (Meulbrook 2000)

Definition: Exposes a firm to potential loss through changes in financial markets; can also occur when specific debtors default

For Mattel:

Drop in market share

Devaluation of company share price

Fall in credit rating

Legal & Regulatory risk (Meulbrook 2000)

Regulatory definition: Exposes the firm with changes in regulations affecting the firm’s business

Legal definition: Exposes the firm to litigation with action arising from customers, suppliers, shareholders or employees

For Mattel:

Changes in regulation and government policies

Lawsuits

Supplier country legalities

Then these have been categorized into various types which have been used as a guideline to examine the risk (table 2) and consequences faced during their great product recall in 2007.

Type of Risk

Identified Risks

Consequences

Causes

Supply Risk

Quality related:

Lead Paint Contamination

Loosely fitted components

Supplier related:

Fraud

Contract Default

Recall of products and associated costs

Lawsuits

Re-evaluation of suppliers

Suppliers pulled out of market

Increased retailer control

Defective raw materials moving downstream

Trust deterioration

Deviation from quality standards

Outsourcing of quality control

Low transparency in Contract Terms

Poor tractability of source of supplier

Falsification of documents by suppliers

Use of uncertified led paint

Deviation from quality standards

Improper sub-vendor tracking

Falsification of documents by suppliers

Improper regulation

Operations Risk

Design related:

Unfeasible magnet design

Recall of products and associated costs

Costs of redesign and R&D

Failed testing both in design and production stage

Flawed R&D

Customer & Reputation Risk

Market related:

Brand Image

Loss in sales

Loss in customer loyalty

Uncertainty

Bad consumer experience and accidents

Health hazards

Falling consumer confidence

Decreased Brand Loyalty

Adverse impact on other products

Loss in revenue

Increased uncertainty in buyers

Harmful products

Betrayal of customer trust

Delicate target market

Legal & Regulatory Risk

Policy & lawsuit related:

Legislative

Regulatory

Lawsuits

Fine by CPSC

Led to new and tighter regulations

Did not track their own standards

Political influence by stakeholders

Financial Risk

Economic related:

Drop in share price

Drop in sales

Drop in sales and revenue

Implementation of 3-fold plan by Mattel

Retail pullout

Recall of products

Media critique and bad publicity

Customer fallout

Strategy Risk

Outsourcing related:

Vendor subcontracting

Sub-vendor quality control

Drop in product standard

Harmed consumer base

Affected brand name

Dropped market share

Vendor subcontracting and then sub-vendor again subcontracting

Flawed track of sub-vendor and sub-sub-vendor activities

Assessing Risk

In this section a probability-impact matrix has been created to assess the impact of risk (mentioned in figure 3) on the supply network of Mattel Toys based on its probability of occurrence.

High

2, 3, 5, 6, 7, 8, 11, 12,

13, 18-23*

Impact

*Refer Appendix ab for description of number

1, 4, 10, 14, 15*

Probability

Low

High

The matrix clearly shows that most of the major risks associated with its supply network lies in High Impact – Low Probability and High Impact – High Probability region. This matrix has been used as a reference to create another matrix (below) for a specific risk that Mattel suffered i. e., the great recall of 2007.

High

Fraud, Contract Default, Quality- Lead contamination, Design- Magnet component,

Impact

*Refer Appendix ab for description of number

Brand Image, Loss in sale, Loss in customer loyalty, Legal & Regulatory, Drop in share price

Low

Probability

High

During this period, all risks had very high impact on Mattel’s supply network and caused setbacks and disruption which were hard to recover from.

Managing Risk

There are a few ways in which Mattel can increase their capabilities of supply chain risk management;

Visibility – In order to properly assess supply chain risk and respond to events, visibility across the supply chain is required. This means that the supply chain risk management tool must be capable of integrating with, and modeling ERP analytics from, multiple disparate ERP systems, including systems supporting the supply and distribution nodes.

Event detection and alerting – The sooner a supply chain disruption is recognized, the faster the response. An alert that shows up in e-mail or a portable e-mail device will ensure that the appropriate people are made aware of the event when it happens. Too many times, event detection is based on the event itself. To be truly valuable, alert should be triggered based on the anticipated impact of the event. For example, if a supplier goes out of business, but the loss of this supplier doesn’t impact key metrics, an alert may not be necessary.

Analytics – The full suite of supply chain analytics needs to be modeled in the supply chain risk management tool to ensure the impact of a potential supply chain event is understood. When an event happens, analytics are used to model the event and determine the impact. Above all, these analytics need to be performed in real time, especially when responding to an unanticipated supply chain disruption. When an event happens, every second counts and a company can’t wait days or weeks to understand the impact or to determine resolution alternatives.

Simulation – Simulation is critical to both sides of supply chain risk management. When assessing the risks, simulation helps to model different risk scenarios. Further, simulation is used to model alternative mitigation strategies to ensure that they are sound. When responding to an unanticipated supply chain event, simulation is used to model and compare the various response alternatives.

Collaboration – The risk management team will need to evaluate several possible mitigation alternatives. Members of the team will likely not have the detailed knowledge necessary to explore all alternatives in the detail needed to develop a robust mitigation strategy. The ability to bring other people into the evaluation process is critical both to validate the proposed strategy and to propose key improvements to the strategy. Similarly when responding to an unanticipated supply chain event, collaborating with those with the detailed knowledge ensures that the response alternatives are reasonable.

Scenario comparison – in the process of developing mitigation strategies or responses, the team may develop multiple approaches that potentially

resolve the problem, but in differing ways. The team needs to make a decision on which resolution or mitigation alternative best meets the goals of the organization. One approach may extend lead times by 30 days, while the other may increase the cost of goods sold by 10%. The decision on which approach is best needs to be evaluated in light of corporate goals.

Form collaborative supply network risk strategy

To be successful in today's aggressive toy market, retailers and manufacturers should drive lean and closely controlled supply chains. As the rate of promotional marketing and innovative product launch continues to grow, companies are mostly caught between dynamic customer demands and comparatively fixed manufacturing and logistics parameters and limitations. Collaborative planning helps in dealing with supply chain issues. To improve supply chain responsiveness in Mattel, it requires shared visibility with suppliers and retailers into events happening now and in the future, while working jointly to resolve issues and problems surrounding delivery constraints.

Implementation

To keep up with dynamism of market demand and unseen risks, Mattel needs to implement its strategies for risk management in clear structured, and/or procedural way. According to Freedman (2003), strategy implementation should encompass order, commitment, ingenuity, management control and advanced execution skills. In Mattel, the Corporate Responsibility division should use this as a guideline for their advisory and research. Freedman (2003) also observed that moderating complexity is one of the core steps in strategy implementation. This is in regard to Mattel's

supply chain network which was complex and vendor mismanagement lead to one of their biggest recalls.

It is recommended for Mattel, to train and educated their workforce to handle unanticipated risks in supply networks (Harland et al, 2002). Their workforce needs to be made more aware of the total inherent risks faced after the great recall and learn to identify such risks in early stages. They need to focus on current practices of risk management and evaluate if these are apt after the recall. Mattel needs to handle complexities within their supply chain network by increasing visibility in it. This can be achieved by examining risk at the level of the network rather than restricted view to just immediate vendors (Harland et al, 2002).. They need to increase access to and control of sub-vendors throughout the supply network. This in turn will help them to expose risks throughout their supply chain. Also they need to develop/upgrade their existing supply network risk strategy and bring it in-line with their organizational practices and the framework suggested here.

The key to successful risk management implementation is by identifying two situations to respond to supply chain events (Source: Kinaxis);

An unanticipated supply disruption1

And, an anticipated supply disruption by executing a mitigation strategy

In both cases, the main task is to alert on time that an event has occurred. It’s difficult to respond to an event if you lack information on it. The supply chain needs to be monitored continuously. The practice of risk management – from spotting risks, through choosing suitable risk management strategies,

and then altering the structure of the supply chain – is an information-demanding procedure (Source: Husdal). This means it is very dependent on information sharing. The key activity then is to identify vital information signalling risk while filtering data.

Critique

The model is critiqued to identify the shortcoming of the framework:

The model is build upon existing model and does not provide any new technique to provide a total security solution .

The model is subjective in nature as the author Harland et al, 2002, themselves pointed out that on categorization and identification of risk, the view of assessors assessing may be different.

It may not always be possible for organizations to continuously examine risks and have strategic frameworks in position

The setting up of collaborative arrangements in supply network and identification of risks and implementation of this in existing system may prove costly

As the model is subjective in nature, there might be difference in opinion of the assessors on the rating of particular risk in the organization.

Conclusion

In the wake of Mattel’s great recall in 2007, it is seen that their strategy for outsourcing brought about one of their biggest losses and led to brand tarnishing and major fall in their market value. Their response to this crisis

was well-handled but this raised questions on how they foresee their risks and avert them?

The suggested security framework draws a bird’s eye view of their supply network and asses risk at every level of their supply chain. It provides 6 key tools to asses risk and some effective steps to implement them. Later this framework is also subjected to self-critique but from a broader picture it can provide some key modification to the shortcomings in Mattel’s current strategy.

Recommendation