The Conundrums of IT Investments in Supply Chain Management

Asim Siddiqui[1], D. Himanshu Rao[1], Anshi Rai[2]

[1]*(Department of Mechanical Engineering, Oriental College of Technology, Bhopal, India*

[2]*(Department of Information Technology, Oriental College of Technology, Bhopal, India*

Abstract

Despite of the fact that IT advancement and its investments have streamlined the complex supply chains, the risks concerned with investment in IT cannot be overlooked. Investing in IT is subjected to ambiguous economic conditions and hence companies ought to rethink their decision to invest in IT for optimizing supply chain capabilities. Moreover, factors such as rapid obsolescent of present technologies, introduction of newer versions and speedy decrement in their cost also restricts the companies from investing in IT. This paper focuses on such enigmatic situations and highlights their possible solutions. It concludes that it is essential for the companies to re-assess their primacies, especially in the times of economic uncertainties and make deliberate decisions regarding where to invest for optimum outcomes. The paper examines these issues through secondary data based on compilations of various research articles and articles from books.

Keywords

Supply Chain Management, IT Investments, Conundrums, Supply Chain Orchestration

1. Introduction

With the rapid emergence and growth of IT, there is an imperative need for the IT industry to mould itself according to the upcoming challenges in the future. IT Investments in Supply Chain Management can be considered as a spring board to remove the prevailing bottle necks in the industry. It is essential for the executives dealing with supply chain to reconsider the IT investment strategies, when technologies such as Cloud Computing, Web, and social media are being used widely.

This can be done pertaining to the following two components of IT Investments:

1. Preserving and maintaining the existing capabilities.
2. Evolving fresh capabilities.

Preservation and maintenance of the existing capabilities can be done by analyzing the current economic status. But evolving fresh capabilities or creating new ones is a tedious job. It is important to retain as to how much additional value and return can be brought together from the new IT investments, i.e., the fresh capabilities, especially when the economic times are uncertain.

The recent technological advances in IT have made it possible to make supply chain lean and thin. In general, it can be said that, without IT systems in place, no supply chain could be flexible and responsive nor it could adapt and associate fast to the changing business needs. But with the changing behavior of the present scenario, it can be said that "uncertainty is the biggest and toughest challenge in today's economy". Thus, large amount of risks and speculations are associated with investments in the IT sector, regardless of concerning about what the actual cause of the uncertainty and downfall is.

2. Understanding Supply Chain Management

The Supply Chain Management can be defined as a system of an organization, people associated with it (directly or indirectly), activities performed by organization, information and resources, all together, involved in moving a product from the supplier to the customer. Supply chain activities transform the natural resources, available raw materials and components into a final product that is delivered to the end customer. Supply chain management encompasses the planning and management of all the

activities involved in sourcing and procurements, conversion and all logistic management activities. The use of information technology is considered as an essential requirement for the effective control of complex supply chain in the current scenario.

The Council of Logistic Management (CLM) (2000) defines SCM as "the systematic, strategic coordination of the traditional business functions and tactics across these business functions within a particular organization and across business within a supply chain for the purpose of improving the long term performance of the individual organizations and the supply chain as a whole".

3. Optimization of Supply Chain Management with IT

Today companies are not merely independent entities, but parts of multiple companies resulting in an intra-company fragmentation network. With growing global competitiveness, companies are trying hard to manage the supply chain in a better manner and increase efficiency to meet the customers' demands, thereby responding to the changing market conditions. It is very essential to know what the client needs. They are acknowledging the importance of IT in supply chain management and using IT for optimization of SCM in following ways:

1. Processing the transactions
2. Planning supply chain and its collaboration
3. Order tracking and delivery management.

Processing of transactions is carried out by incorporating the use of IT for increasing the efficiency of repetitive exchange of information between supply chain partners. This includes tasks such as order processing, billing, delivery and dispatch verification etc.

Planning Supply chain and its collaboration refers to the use of IT for sharing information related to planning such as demand information, inventory and production capacity information which can increase the effectiveness of the supply chain.

Order tracking and delivery management represents the monitoring of orders, consisting of final products, so that they reach the end customers in time and safely.

In this manner, the companies are recognizing that IT can provide capability and IT investments are definitely growing. Clients should be offered not only with consulting, and product services, but also with solutions that are industry and function specific. Hence levering the solutions, clients can innovate, transform and optimize their supply chains and obtain handsome business value from their investments.

Diagrammatic Representation

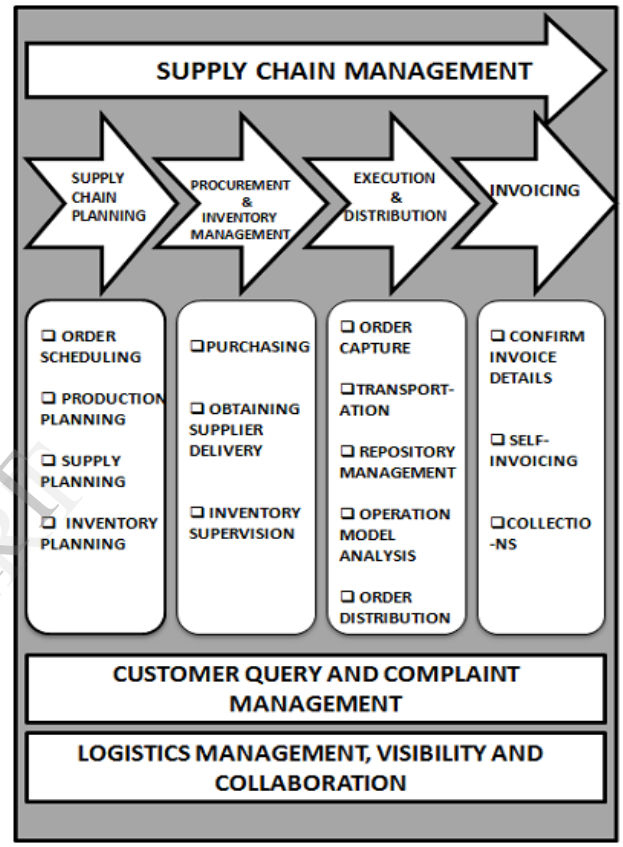

Figure 1: Supply Chain Model used in IT Companies

4. The Driving Forces

Simchi-Levi et al. (2003, p. 267) list the objectives of IT in SCM:

- Providing information availability and visibility
- Enabling single point of contact of data
- Allowing decisions based on total supply chain information
- Enabling collaboration with supply chain partners

The ultimate goal of supply chain management is to enable an organization and its associates to understand, comprehend and enforce the changes in the characteristics of the products, the demand for product and the supply of raw materials that is

required for development of the product, in order to meet the requirements of the customer at an optimum cost.

With IT being involved this is being carried out with reduction in the costs of operational processes by reducing manual efforts, improvement of quality of information as human errors are eliminated and rapid exchange of information between organizations.

5. The Conundrums: Puzzles to be pondered

An extensive research is being carried out in the area of supply chain management and it is widely gaining popularity amongst researchers and practitioners from varied disciplines. Supply Chain Management can be used in various capabilities in different parts of the business, as per the customer's requirements. But now the concern is that the people or organizations involved should see these investments with a broader perspective. Here are some of the possible reasons that might help to rethink the perplexity of IT investment in supply chain management:

- It is very essential for every organization to have independent IT investments especially for meeting its infrastructural requirements. But this segment is under threat because the part of the investments which must be used for up gradation, enhancement and maintenance of the infrastructural needs is reallocated to the new projects obtained by the company or to other different capabilities that might be looking more promising to the company in terms of improving its business.

- Other possibilities could be that before making any IT investments, a company always wants that it should invest its capital in newer technologies or the advanced versions, that too at an optimized cost (cheaper) than the currently existing ones. But due to the fast and rapid changes in the technology over shorter durations and a slow decision making process involved at company level, by the time the company is all set for the investments, a much advanced or newer version of the technology is released in the market. As a result, the company perhaps postpones its decisions relevant to the above case. This situation might come again and again and the process goes on, resulting in an unstable state of the IT investments.

- Considering a different scenario in which a company instantly wants to implement or increase it IT infrastructure. So it readily invests in the currently available versions, that too at higher costs. Soon it realizes that it has invested on something which is likely to become obsolete very early. Such investments become a liability to the company.

- Changes occurring in the market and consumer behaviours are pressurizing companies to enhance their customer services and become more and more agile. Companies are in a dilemma as to what strategies they should adopt to adapt with the ongoing technological, regulatory, and ecological changes such that the business can retain profitability and market share. Widespread economic pressures as well as rising transportation costs are initiating companies to pay more attention to cost saving measures. All these factors are resulting in enormous pressure on their supply chains.

6. Possible Solutions

A very balanced and rational decision needs to be taken while investing in IT. Supply chain managers can have many tools at their disposal to find solutions of the conundrums. They are as follows:

6.1. Supply Chain Orchestration

Orchestrating the elements in the supply chain can enhance its efficiency and effectiveness. The Supply Chain Orchestration approach refers to the integration of supply chain by bringing together all aspects of the supply chain, including people, process, technology and physical resources to optimise supply chain operations. This approach includes supply chain transactions and processing, logistics and network management and ensures sustainability in operations. This can be enabled through Business Process Outsourcing (BPO) or managed service provider.

6.2. Green Supply Chains

Adoption of Green Supply Chain will not only benefit the optimization and sustainability, but will also focus on integrating it with an environment friendly approach. Patrick Penfield of the Whiteman School of Management defines Green Supply Chain Management (GSCM) as "the process of using environmentally friendly inputs and transforming these inputs into outputs that can be reclaimed and re-used at the end of their lifecycle thus, creating a sustainable supply chain."

With Green Supply Chain, development of energy efficient solutions can take place which will be more favourable for the environment. An example could be adoption of 'iteration and reuse' approach for

disposal of IT waste. IT can also optimize transportation and ensure efficient delivery of goods in an eco friendly and cost effective manner.

6.3. Collaborative Supply Chains

Collaborative Supply Chain model is effective for working more closely in communities of shared interest. This can also be delivered through a BPO managed service. Companies can derive the benefits of sharing resources and information when they have shared objectives. A collaborative community of clients should be recognized operating in common locations. These can a number of benefits including cost reduction and lower environmental impact.

6.4. Role of Analytics

Analytics can be of great importance when IT investments are in consideration. The massive data on the supply chains is a valuable resource for the company. Analytics can formulate data management approaches by incorporating the construction of data warehouses comprising of data in multiple forms. The data from the warehouses can be put into a cloud, thereby increasing its visibility. With aggregation of the data, physical processes across the supply chain are made more visible.

6.5. Careful Analysis of the Infrastructure

Companies should carefully analyze their infrastructural requirements. A part of the investment made by the companies should be solely for maintenance and up gradation of the existing infrastructure as well as for deployment of newer technologies. This part of the investment should not be used for any other project related task.

6.6. Alignment of Supply Chain Strategy with Business Strategy

So far, Indian companies have marketing, personnel, accounts and other departments but very few have supply chain department. Purchase or procurement sections more or less carry out the supply chain and logistic functions. These departments however are not aligned to follow supply chain as a strategic area and are often not in harmony with other departments or with partners. Now the time is ripe to align competitive advantage, increase profitability, and market share in these challenging times.

6.7. Competitive Supply Chains

Companies should ensure that their end to end supply chains are completely visible and a seamless integration should exist between internal systems and external parties. Since even a minor disruption at any point can lead to the failure of the entire system, so the companies should be able to predict and mange these disruptions. At the same time, they should be able to meet their customers' demands, that too in a cost effective manner.

6.8. Enforcing Independence

Organizations should be able to collaborate with others in supply chain operations by means of a third party to manage the interfaces. Companies should offer the independence, as well as industry expertise to manage supply chain collaboration to the satisfaction of all the parties concerned. Complexities existing in the supply chain should be studied and analyzed and efforts should be made to make it more customer centric.

7. Conclusions

It is well known that with the advancement of technology the world is shrinking day by day. Companies are becoming more and more prone to the uncertain environment. The demands of the customers are also increasing rapidly. Companies are formulating different strategies in order to meet their customers' demands satisfactorily, in a cost effective manner. This paper has explored various scenarios as to why IT Investments play a vital role in supply chain management. It also throws light on the conundrums that occur while making IT investments in Supply Chain Management. While investing in IT, a company should seek to re-balance its priorities, especially in the times of economic uncertainties. The companies have to extend their peripheries of conventional approach of supply chain integration. Innovations should be done in supply chain which can directly impact on companies business in future. Company should harness as much as it can from technology such as Internet, Web, E-commerce, Cloud Computing etc so that it can efficiently improve its business and also provide a better way to collaborate and coordinate with its partners. Thus, the investments in procurement and supply chain management should continue to increase, and those who are making these investments will receive a good return on its investments in IT.

8. Research Methodology

The research includes compilation of research articles of the experts in the field of IT investments in supply chain management. This research paper is a comparative study and is based on an approach which is exploratory in nature.

9. Acknowledgements

We are grateful to the teaching staff of Oriental College of Technology, Bhopal for guiding us throughout the completion of this research; as well as to all our peers for their active participation.

10. References

[1] Robert Handfield, "*The Supply Chain IT Investment Enigma: Companies are Rethinking IT Investments",* North Carolina State University, Apr, 21, 2011

[2] M.Venkata Ramana Reddy & N.V.S. Raju, Issues and Challenges of Supply Chain Management in India, *International Journal of Mechanical and Production Engineering (IJMPE) ISSN No.: 2315-4489, Vol-2, Iss-1, 2013*

[3] The Council of Logistic Management (CLM) (2000)

[4] Jaana Auramo, Jouni Kauremaa, Kari Tanskanen, *Benefits of IT in supply chain management – an explorative study of progressive companies*, Helsinki University of Technology, Finland

[5] Jouni Kauremaa, Jaana Auramo, Kari Tanskanen, Mikko Kärkkäinen, *The use of information technology in supply chains: transactions and information sharing perspective,* Department of Industrial Engineering and Management, Helsinki University of Technology, *LRN Conference 2004, September 9th and 10th, Dublin*

[6] Tony Kelly, Capgemini Business Process Outsourcing, Supply Chain Management Services, 2011.

[7] http://www.infosys.com/supply

[8] Bhavani, *Information technology in India, its previous and current status, future and impact on other sectors,* http://www.indiastudychannel.com, Aug 2011

[9] http://www.mbaskool.com/business, Role of Information Technology in Supply Chain Optimization, May, 2012