

Multi Modal Logistics and Value Creation in Supply Chain Integration

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Abstract—

Significance / relevance of Multi Modal Logistics:

Traditionally, Ports and Terminals are considered the gateways to each country in terms of providing required point of import and export of goods. With the evolution of modern technology, the role of Ports and Terminals has evolved to that of comprehensive multi modal logistics services and solution provider. With ambitious plans for their ports and terminals; governments all over the world are increasingly encouraging and providing various incentives to investors and operators to build and expand Ports and Maritime infrastructure. While these steps are resulting in creation of desired maritime infrastructure for the nations, it has also led to creation of over capacity of ports and maritime infrastructure. In order to compete effectively and for sustained business viability, Ports and terminals need to identify their own USP and value addition they can offer to their customers. Efficient Multi Modal International Logistics is increasingly gaining greater significance in the competitive business environment in every aspect of life. In present age of Information Explosion, well informed consumers expect and demand best value for their money. With greater efficiency logistics in supply chain is in a better position to provide expected value addition to the consumers. Due to this intrinsic demand, in addition to conventional international trade, there an equally important aspect to manage the efficiency of complete chain for transfer of materials and final goods from the point of origin to the point of usage. For an efficient Logistics chain, Ports and Terminals play a very crucial role. This is a great opportunity for Ports and terminals to expand their roles.

Future scope/Limitations:

Working relationships between suppliers and customers, which some like to call "partnerships?" Calling business relationships "partnerships" doesn't make them so. Furthermore, there are limits to how many partnerships any company can effectively maintain. Certainly, you can't have partnerships with everyone in your supply chain, unless the chain consists only of you and two others.

Findings: The world's largest democracy is well on its way to becoming the world most powerful economy. Concepts such as just-in-time, virtual inventory, supplier rationalization, and reductions in the number of distribution facilities have reduced total supply chain costs, but the result has been increased risk. In an ideal supply chain relationship, both customers and suppliers get connected in ways that allow them to easily exchange information, demand data, and the visibility of status, it means communicating demand events and the direction of strategic plans. It also means linking information systems and jointly leveraging the potential for Internet and other electronic

communications. Working together is to reduce costs and improve quality, and understanding capacities and capabilities.

Research Hypotheses:

The study has been carried out with following hypotheses:

H1: Inventory & Warehousing management system would serve as enabler in supply chain management to improve operational performance.

H2: Transportation & Distribution management would serve as enabler in supply chain management to improve operational performance.

H3: Strategic sourcing & Supplier relationship practices would serve as enabler in logistics

Scope of the Study:

This paper will attempt to help in identifying the unique selling point / unique selling proposition (USP) for the Ports & Terminals by redefining the role of the total multi modal logistics services provider and strategies to position the new role among customers.

Keywords: Supply Chain, Multi Modal Logistics, Value Creation

1. INTRODUCTION:

This review - research (after the study of various Journals and published papers) is an attempt to work on the challenges and success journey which stand behind finding integration in the supply chain. The main contributions for this paper is to integrate all the supply chain challenges in India / Globe The impact of natural and man - made disasters, as well as constant changes to regulatory requirements, highlights the need for a robust understanding of supply chain risk and effective risk management.

The supply chain concept has become a concern due to global competition and increasing customer demand for value because the Companies try to improve their industrial performance in terms of cost, delays, adaptability, variety and traceability. Thus, the information must be available in real time across the supply chain and this cannot be achieved without an integrated software system for supply chain management. Supply chain members have to collaborate, sharing information for improving customer's satisfaction.

The mode of integration in the value chain can impact a business organization in multiple ways and affect the sustainability of its competitive advantage.

Success of the value chain would depend on the mode of relationship between the Supply Chain partners. The mode of relationship is fundamental to the design of the value chain. The objective of this article is to identify appropriate factors, which would indicate the mode of relationship between value chain partners and develop a “Decision Support Strategy Matrix” to facilitate appropriate choice of relationship. Value chain integration takes place over a period of time and to varying degrees based on the relative size, scope, ownership, and stakeholders' interest. Finally, the implications for practices and scope of future research are identified in this paper. This research article is a blend of theoretical framework and practical application for managers.

2. SUPPLY CHAIN AND LOGISTICS:

According to Ganeshan and Harrison (1995), a supply chain is “a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers.” Many supply chains have been significantly altered over the past decade, but this core definition remains unchanged.

A supply chain is defined as “the integration of key business processes from end users through original suppliers that provides products, services, and information that adds value for customers and other stakeholders” (Lambert et al., 1998). Here, a supply chain includes all the value chain processes from suppliers to end customers. It is imperative that each supply chain participant adds value from the perspective of the end customer in the supply chain.

India has witnessed an attractive growth story in the Logistics and Supply Chain sector, on the back of factors such as rapidly growing economy, increase in outsourcing of logistics, steady supply side changes, significant government investment in core infrastructure projects and landmark changes in tax and regulatory policies. The sector is experiencing a number of supply and demand side changes, which are carving a way for in numerous opportunities. The growing emphasis on alternative transport modes, thrust on outsourcing driven by growing business complexity.

Following are the major drivers for SCM and marketing integration:

- Increased needs and requirements of the customers;
- Globalization of world economy;
- Increased competition, leading to higher thrust to lower prices;
- Standardized products and services; and
- Shorter product life cycles.

When SCM side of supply efficiency is combined with the marketing insight, a number of benefits emerge. These benefits include:

- Reduced level of inventory from having precise information of inventory availability;
- Reduced lead times from better visibility of demand for products;
- Improved customer service and retention resulting from an improved ability to meet delivery on time;
- Increased sales from being able to confirm the availability and delivery of standard and enhanced products in real time; and
- Increased responsiveness by working across various sales channels, while taking into consideration production constraints.

3. RESEARCH HYPOTHESES:

H1: Inventory & Warehousing management system would serve as enabler in supply chain management to improve operational performance.

H2: Transportation & Distribution management would serve as enabler in supply chain management to improve operational performance.

H3: Strategic sourcing & Supplier relationship practices would serve as enabler in logistics

4. OBJECTIVES OF MULTI MODAL LOGISTICS:

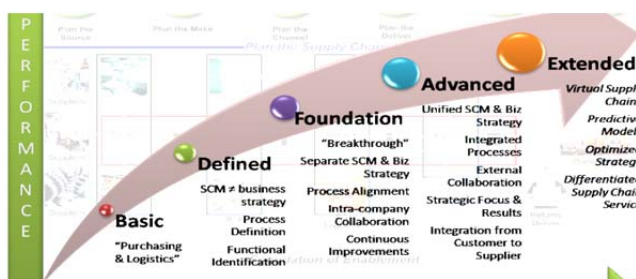
- Market Mapping to identify logical hinterland of the port & Terminal for multi modal logistics
- Classification of Primary, Secondary and Tertiary Hinterland of the port and logistics costs
- Identification of Primary, Secondary and Tertiary Customers of the Port Facilities and Services
- Understanding and defining the product for marketing – Infrastructure, services of port
- Analyzing customers' expectations and requirements to prepare USP of the Port
- Prepare a long term strategy for Business Development and Marketing of multi modal logistics services
- Work out a road map for sustainable long term business by focused business development strategy to attract large customers for port based industries / district parks / other multi modal services
- Set up an effective Customer Service department for personalized service to port customers

- Prepare Value Proposition in line with customers' expectations and requirements from the multi modal logistics service provider – the redefined role of the port / terminal
- Develop USP for the port & terminal as comprehensive multi modal logistics services and solution provider
- Market mapping to measure potential of business
- Ways to match customers' service expectations and Port facilities and services with multi modal logistics chain framework

5. BUSINESS DEVELOPMENT AND MARKETING STRATEGY:

Business development and marketing strategy is for sustainable multi modal logistics business from identified large players from targeted industries to adopt a balanced approach between operations, sales and role of Customer Service to ensure delivery of promised level of services to the customers for delight and long term business from customers. Strategy is to prepare Value Proposition for customers using Port / Terminal as centre of multi modal logistics chain.

Supply Chain Maturity Model: The performance of a supply network decides the company's success and it is therefore, critical to develop a mature supply chain approach for the visibility of supply and demand collaboration. "The integration of key business processes from end user through original suppliers that provide products, services and information that adds value for customer and other stakeholders." (Chan and Qi, 2003; Gunasekaran et al., 2001). The concept of maturity in supply chain network derives from the understanding that networks have life cycles that can be clearly defined, managed, measured and controlled throughout the time.



6. SUPPLY CHAIN MANAGEMENT BY ITS VERY NATURE DEPENDS ON RELATIONSHIPS AND CONNECTIONS:

India is becoming a global - Industry hub. Increasing demand in domestic and international markets is opening a new world of opportunities for the Indian Industry. Increasing competition, due to globalization is making inevitable for the Indian industries to provide cost effective quality output with stringent delivery schedules. Issues in supply of inferior

quality, delayed supply, unwarranted cost escalation, etc. would adversely impact the credibility and business potential of the Indian industry. Amongst many difficulties faced by Indian manufacturers, supply chain disruption management is a major issue, which can result in large tangible and non-tangible losses. In current study lot of efforts has been done to understand what the Supply Chain Management & logistics is and how it is affecting organizations, what are different challenges and it can be proved as a tool for improving overall performance in today's global competitive environment. At present, Indian economy is on the fulcrum of an ever rising growth curve. There is a positive indicator such as a stable annual growth, rising foreign exchange reserves.

Information sharing among logistics partners can take place about anything that leads to amelioration of operational efficiency and attainment of environmental objectives. For example, customer demands, vehicle resources, warehousing capacity, goods inventory or technological know-how. Information sharing leads to visibility in supply chains which in turn leads to cooperation among supply chain partners.

Coordination: Coordination can be defined as alignment of project objectives and resources in order to achieve the successful collaboration. Effective coordination among all enterprises cooperating with one another in supply chain is essential to its success. The coordinating actions are fundamental, those that

- (1) Stimulate the Supply Chain & Logistics through the creation of a growth concept,
- (2) Regulate the Supply Chain & Logistics by redistributing the possessed resources
- (3) Integrate the Supply Chain & Logistics by linking resources, monitoring and an assessment of the actions.

In a supply chain, trust is one of the key cooperation factors. It is during cooperation when complex trust based reactions occur, since one entity's gains depend on the other. The risk and uncertainty connected with trust and cooperation develop as the number of participants increases.

Willingness to Collaborate: Willingness to collaborate is vital in achieving successful collaboration. Disinterested partners lack commitment and may leave the collaboration anytime leading to waste of resources, time, money and personnel.

Communication: Communication is effective communication among all elements of supply chain. Clearly communicated goals across members of all hierarchy in the organization leads to efficient realization of planned objectives under given time, pressure and resources

Common Business Goals: Common business goals are one of the main reasons behind any organization's interest to collaborate with other partner organizations. Similar business goals lead to common practices, techniques, and efficient

sharing of knowledge leading to win-win situation for all the organizations participating in collaboration.

Responsibility Sharing: Responsibility allocation and sharing among the participating organizations leads to increased trust, information sharing, and commitment from the involved partners and fosters strong collaboration.

7. PLANNING OF SUPPLY CHAIN ACTIVITIES:

The Efficient and timely planning of supply chain & Logistics activities is reducing waste of time, resources and money arising from last minute changes in customer demands or unstable market conditions. For successful collaboration, right planning also leads to efficient realization of goals, sharing of resources, and profit allocation.

Flexibility: Organizations participating in any collaboration do not always have the same experience, culture, technological readiness, or brand image. Under these situations, it is vital for participating organizations to be flexible to adapt to others needs for joint success. Richey et al. identify technology and flexibility as key enablers for logistics collaboration.

Benefit Sharing: Benefit sharing among participants is vital for retaining loyalty towards collaboration. Benefit sharing can be done equally among partners or depending upon the stakes of major contributing organizations after mutual consensus.

Joint Decision Making: All the organizations involved in collaboration should work together and perform joint decision making to achieve operational and environmental goals. This will lead to increased trust and commitment which is essential for long term success of any collaboration.

Organizational Culture: Organizational culture is very important in sharing of common vision and goals for any collaboration. Participating organizations should have a good understanding of other participant organizations culture to avoid any misconceptions and gaps that can serve as barriers in realization of project objectives.

Organizational Compatibility: Organizational compatibility in terms of product-service types, size, location, strategy, employee culture, technology, management commitment, budget, resources etc. aids in developing successful collaborations among the participating organizations.

Resource Sharing (Integration): Once organizations enter into collaboration, it is important to address the goals of all participants efficiently, uniformly and in time either through partial and/or complete sharing of resources. This will also help in achieving successful project co-ordination and completion.

Top Management Support: Commitment from management includes an effort and financial backing from the upper management to implement sustainability in logistics

operations. Top management commitment retains employee interests in implementing sustainability practices and continuous improvement goals. In order to achieve long term success, management support and commitment is very important and should be accompanied with employee rewards and training programs.

Technological Readiness: Use of IT tools to monitor the supply chains and sharing information among the partner's leads to visibility in supply chain, thereby providing better cooperation among different levels of the supply chain. Electronic data interchange and internet have enabled partners in supply chains to act upon same data rather than rely on distorted and noisy data that emerges in an extended supply chain. Swafford et al emphasize the role of IT integration and flexibility in achieving Supply Chain & Logistics agility.

8. WORLD PORTS - SCENARIO AND MULTI MODALS:

A global perspective of changing role of the ports and terminals providing multi modal logistics services for last mile connectivity, and the binding standards for infrastructure development which are indispensable for clean fleets to operate throughout Europe, as well as for transport services to become safer and more energy efficient. They include, for example, reinforced provisions on:

- Multi-modal infrastructure (including corresponding intelligent transport systems) which is of vital importance to enabling seamless transport chains across modes and future-oriented logistics solutions, and to stimulating the shift of long-distance freight traffic from road to rail and inland waterways;
- Traffic management / intelligent transport systems for all transport modes as an integral part of development which help reducing accidents, using infrastructure as efficiently as possible and developing advanced user services.
- Infrastructure components for innovative transport solutions, in the field of alternative fuel and many other areas, which not only lead Europe's mobility system into the future but also make a significant contribution to European industrial leadership.

9. KEY POINTS MULTI-PURPOSE PORT BUSINESS:

- Understand the multi-purpose port business
- Understand the port marine services, port facilities usage and its charges.
- Understand how the port activities are organized to interface with one another
- Understand the ship side operations aware of the importance of ports being managed as commercial enterprises irrespective of their ownership.

- Understanding the port tariff, order to cash process and the port billing
- Business Process outsourcing and choosing a contractor

Guidelines for Abandoned cargo

10. MAPPING AND CUSTOMER CLASSIFICATION:

Customer requirements analysis is the key step for product variety design of mass customization (MC). Quality function deployment (QFD) is a widely used management technique for understanding the voice of the customer (VOC), however, QFD depends heavily on human subject judgment during extracting customer requirements and determination of the importance weights of customer requirements. QFD process and related problems are so complicated that it is not easily used. In this paper, based on a general data structure of product family, generic bill of material (GBOM), association rules analysis was introduced to construct the classification mechanism between customer requirements and product architecture. The new method can map customer requirements to the items of product family architecture respectively, accomplish the mapping process from customer domain to physical domain directly, and decrease mutual process between customer and designer, improve the product design quality, and thus furthest satisfy customer needs.

11. TERMINAL AS A MULTI MODAL LOGISTICS SERVICE PROVIDER AND PREPARE VALUE PROPOSITION FOR THE CUSTOMERS:

Shipping lines operate a fleet of vessels, partly owned and partly chartered, in combination with a fleet of containers, also partly owned and partly chartered. The vessel and container fleet represent a large amount of capital. Shipping lines are therefore 'asset heavy'. As all asset heavy companies, shipping lines focus to a large extent on operational efficiency. The core business of shipping lines mainly consists of two operations: vessel logistics and container logistics. Vessel logistics is aimed at optimizing the revenue generated by the vessel by minimizing slot costs, maximizing capacity utilization and yield per slot. The introduction of (super) slow steaming and larger vessels shows the importance of low operating costs. Container logistics is relevant for shipping lines as they provide a transport service including the use of a container. When the container logistics is controlled by the shipping lines this is termed carrier haulage, when it is controlled by the forwarders (or shippers) is termed merchant haulage. All major shipping lines provide door-to-door services, but also offer intermodal services to /from container yards as conditions have been favorable to the development of long-term contracts for effective rail service. The percentage of carrier haulage differs substantially per country, mainly due to historical reasons. In most ports, >50% of land transport flows are organized under 'merchant haulage'. Carrier haulage in Europe's largest port is estimated to be somewhere between

25% and 40%. The percentage of (door-to-door) carrier haulage also differs significantly between shipping lines. This shows that the shipping lines handle substantially larger volumes of containers. However, they have not been able to translate this scale in attractive door-to-door propositions.

Financial impact of the redefined role of the port / terminal – multi modal logistics service provider v/s provider of only port / terminal services:

Regardless of contractual arrangements, importers and exporters are the final users of the port. They pass on their generalized port costs to their customers. Various potential structures of charges from port authorities, which are virtually all government - owned, and increasingly operate as a landlord, to port users. Importers and exporters receive a charge from shipping lines that generally includes port costs. Furthermore, port users may directly pay handling fees to terminal operating companies. The port users may be directly charged by port authorities, & such direct charges are often termed 'cargo warfare'. In a large number of ports, such cargo wharf age charges do not exist. In these cases, shipping lines and port service providers charge importers and exporters, and exporters do not pay directly to port authorities.

12. THREE CRITERIA NEED TO BE MET FOR QUALIFYING AS A TWO-SIDED MARKET:

1. The main benefits of the two distinct markets arise from interacting via a common platform. A common feature of platforms is that they are able to minimize transaction costs and provide a platform that offers interaction as service. As a result, the existence of a platform is justified by transaction cost minimization as its value offering.

2. The interaction of the two markets linked to the platform leads to complementarities; both markets gain from each other's presence. Yet, the positive externalities arising from the interaction are not internalized by users. So, when deciding whether or not to use the platform, the positive externalities that are caused on the other users of the platform are not taken into account.

3. The attractiveness of the platform, expressed in total number of interactions, depends not only on the overall price charged by the platform, but also on distribution between both sides. A key condition for this to work is that users of the platform are unable to bypass the pricing structure. The two-sided market concept has been applied to airports.

Collaboration is vital to achieving success in sustainable logistics operations. Modern logistics operators are under increased pressure and administrative regulations in order to fulfill environmental objectives, reduce congestion and make parking space available for public space. For example, vehicle timing, access and sizing regulations are limiting the areas, timing and size of delivery vehicles. Likewise, tax rebate policies may encourage the use of clean energy vehicles or energy efficient goods distribution practices. Under these

conditions, collaboration seems a logical and viable strategy for many logistics operators to achieve operational performance as well as successfully meet environmental targets.

13. SUSTAINABILITY FACTOR:

Sustainability factor taking Supply Chain & Logistics value beyond boundaries - not only confining to Supply Chain & Logistics Management, Supplier, consumer, extended supplier, and other service providers but also goes beyond boundaries to consider Society, Nation, Global community and Environment by considering value impacts of direct as well as indirect, and effects of both tangible and intangible values. Governance & Sustainability is the ability to meet current needs of governance without hindering the ability to meet the needs of future generations in terms of Supply Chain & Logistics Management, Market, Economic, Environmental and Social challenges of the business worldwide.

14. INDIA'S ECONOMY:

India's economy has been fuelled by the growth in the technology sector in the recent past. A large part of this growth is dependent on the "outsourcing" or "off shoring" of key business processes and software development activity (and related services) by large global corporations and other organizations. The logistics industry in India has a long way to go in achieving the desired levels of efficiency. It is therefore the right time to look at the trends and challenges facing the sector. At the same time - Industry increasingly looks to foreign markets for growth opportunities, or to foreign suppliers for improved sourcing opportunities.

The increasingly flattening world is constantly evolving and impacting the way - Industry does their businesses. The success of a company depends on developing innovative Supply Chain & Logistics strategies that help the company to win, in turns and make money from information while driving continuous improvement. Supply Chain Management (SCM) practice enables world's leading organizations to re-align their supply chains to the flat world paradigm by providing functioning solutions for company needs in supply & demand planning and forecasting, sourcing & procurement, Supply Chain & Logistics execution and enterprise asset management. The supply chain is the flow of information, fund and material through a - Industry company, from the supplier to the customer. Traditionally the flow of material has been considered only at an operational level, but this approach is no longer adequate. It is now essential for business to manage the Supply Chain & Logistics in order to improve customer service, achieve a balance between costs and services and thereby give the company a competitive advantage

15. DRIVERS FOR ECONOMIC GLOBALIZATION:

The drivers for globalization are as follows:

- a) Decreasing Tariffs
- b) Improved Transportation, communication and Information and Technology
- c) Globalization of Products, Services, and Markets
- d) Global Competition
- e) Economic Regionalism

These resulted global competitors to make product and services available to consumers worldwide, and the results have been a proliferation of choices for consumers and need for - Industry to offer greater products and services quality at a lower cost in order to remain competitive. The Supply Chain & Logistics has become both more critical to success and more vulnerable to disruption in Global and Regional Industry to be sustained.

The latest principles of Supply Chain & Logistics models and innovative practices that Supply Chain & Logistics managers can demonstrate in detail how to balance the long - term strategic view with the need for short - term agility in coping with the inevitable disruptions that affect global organizations sustainability.

16. ENTERPRISES THROUGH EFFICIENT SUPPLY CHAIN & LOGISTICS IN GAINING COMPETITIVE ADVANTAGE VIA BUSINESS INNOVATION AND TECHNOLOGIES:

The good news is that India knows how to make an innovation leap. Roughly 20 years ago the Indian technology sector created a new global industry from scratch when it practically invented business process outsourcing. Today, India's services industry may have become a victim of its own success.

Innovation must be understood in the largest possible sense of the notion: the new products manufacture, the new production technologies, the new equipment acquisitions, the improved management or financing methods, the improved performance and qualification of the labor force, the improved informational system and so on. In the strategic enterprise's option must be inserted the innovation implementation methodology that is the main source and tool to gain the competitive advantage. Innovation is being recognized as offering a competitive advantage, being one of the few sustainable advantages in today's economy. Next decade, it is clear that innovation will help the - Industry continually grow and differentiate from their competitors. - Industry should create a continuous capability for innovation and modify their organizational cultures to embrace and support innovation, as innovation is rapidly becoming an enabler that strengthens and focuses the corporate strategies. Companies inventing and implementing of new thoughts, products or services will be leaders in their markets. Industry give values innovation will easily gain competitive advantage. Competitive advantage ensures - Industry to have sustainable success, a dominant position in their market. Shipping lines can create a

competitive advantage through offering an inland terminal centered value proposition. This would replace the door-to-door value proposition, which cannot be seen as a competitive advantage as it is offered by most shipping lines. Shipping lines with a well-established brand reputation are particularly well positioned to attract existing customers (e.g. customers currently buying the door-to-door service) due to lower information acquisition to customers

17. TODAY'S INDIA CAN HELP MULTIPLE ENTERPRISES FOR SUPPLY CHAIN & LOGISTICS RISK:

The efficient Supply Chain & Logistics of today adds to globalization, lean processes, and the geographical concentration of production, among other factors, Supply Chain & Logistics and transport networks are more efficient than ever before. This increasing sophistication and complexity, however, is accompanied by increasing risk.

In the globalized Supply Chain & Logistics Management, risks have increased; there are concerns about the ability of organizations to address this new risk profile. Supply Chain & Logistics and Transport Risk, points out, most enterprises have logistics and transportation risk management protocols that can address localized disruptions.

Greater Supply Chain & Logistics risks outside the control of individual organizations, however, can have unintended consequences that no one organization can mitigate. Supply Chain & Logistics and transport concerns that have increased organizations' risk profile, creating the need for more dynamic supply chains.

Information/communication disruptions: Growing reliance on online systems and the sophistication of cyber attacks place ever-greater stress on Supply Chain & Logistics and transportation networks.

18. INFRASTRUCTURE FAILURE:

Critical infrastructure, from roads to power stations, is under pressure due to lack of investment and planning for future resiliency.

Reliance on oil: The reliance on oil as the single greatest vulnerability to supply chain and transportation networks. An immediate change in oil availability as the result of external disruptions such as civil unrest or terrorist attacks could have an extensive global impact on transport networks in particular. This vulnerability is itself a subset of a broader, long-term challenge of addressing oil reliance. A more dynamic Supply Chain & Logistics might respond by varying sourcing options based on a reassessment of a company's global - Industry footprint that moves production closer to target markets and reduces shipping costs.

Legislation and regulation: well intentioned government initiatives such as air cargo screening can impede the efficient

flow of transport networks. While there are significant new risks arising on these and other fronts, organizations also have new opportunities to improve their supply chain and transportation risk management, & can have trusted networks for effective collaboration.

19. SCM SPEND INDICATOR:

- In-bound Transportation Costs as percentage of Net Sales
- Inventory-related Costs as percentage of Net Sales
- Distribution Expenses as percentage of Net Sales
- Total SCM Spend as percentage of Net Sales

20. GLOBAL SUPPLY CHAIN & LOGISTICS, SUPPLY AND VALUE CHAIN TRENDS:

- Globalization
- Increased cross border sourcing
- Collaboration for parts of value chain with low-cost providers
- Shared service centers for logistical and administrative functions
- Increasingly global operations, which require increasingly global coordination and planning to achieve global optimums
- Complex problems involve also mid-sized companies to an increasing degree

The efficient Supply Chain & Logistics is possible through Coordination of operations with all the - Industry involved in the entire sequence of suppliers that contribute to the creation and delivery of a product or service. Effective Supply Chain & Logistics management can provide an important competitive advantage for a business marketer, resulting in improved communication and involvement among members of the chain, increased motivation, and decreased costs. Tracking the movement of and demand for components used to manufacture a product across a variety of potential and actual suppliers, known as the Supply Chain & Logistics, to provide insight and the ability to respond instantly to shortages, surpluses, and changes in market conditions. It seeks to optimize production, decrease manufacturing time, minimize inventory, streamline order fulfillment, and reduce cost.

By comparing different view of Supply Chain & Logistics Management practices from Indian organizations across the Supply Chain & Logistics, it is possible to identify the strength and weakness of the Supply Chain & Logistics and also the best common Supply Chain & Logistics Management practice across the Supply Chain & Logistics. It will also be interesting to examine the impact of Supply Chain & Logistics structure (Supply Chain & Logistics length, organization's position in the Supply Chain & Logistics, channel structure,

and so on) on Supply Chain & Logistics Management practice and competitive advantage. Thus, for any degree of vertical disintegration, choices must be made among alternative Supply Chain & Logistics management techniques. In weighing the respective costs and benefits of alternative techniques, each firm must decide which is best. Several factors could impact this decision:

21. ECONOMIC IMPACT OF INADEQUATE INFRASTRUCTURE FOR SUPPLY CHAIN & LOGISTICS INTEGRATION:

Supply Chain & Logistics Optimization in Practice expertise managing and operating complex activities: Although many companies are using Supply Chain & Logistics software and Internet-enabled solutions, others have benefited by redefining the roles of the players in their Supply Chain & Logistics as well as by leveraging the knowledge of Supply Chain & Logistics experts.

Increased Globalization of Supply Chain & Logistics:

The proliferation of free trade agreements, increased membership in the World Trade Organization (WTO), and historic increases in the volume of cross-border trade all indicate that the trend towards internationalizing business will continue. David Ricardo's law of comparative advantage has proven that it is more efficient for countries to specialize in a few products rather than produce many goods at a high opportunity cost. As - Industry around the world continue to learn of the cost savings involved in moving certain job functions and process facilities to the most cost-effective location, outsourcing will increase.

The growth in the globalization of business will inevitably be accompanied by growth in the internationalization of Supply Chain & Logistics. The implications of this growth transcend scaling problems that attend normal Supply Chain & Logistics expansion. Rather, particular sets of problems become salient in the international context. The question is not whether Supply Chain & Logistics will continue to internationalize but how to manage the process to the best advantage of domestic industries.

22. MOTIVATORS TO INTERNATIONALIZING TRADE:

For an individual company, many factors might lead to the globalization of its Supply Chain & Logistics. However, four main factors consistently motivate companies to move operations overseas:

- Access to complementary assets,
- Cost savings,
- Marketing necessity, and
- Trade regulations.

By access to complementary assets, we mean that if a certain resource (e.g., raw materials) is located in a particular country, then a company would be more likely to perform other activities in that country if other circumstances are not prohibitive. As an alternative example, a company might decide to move R&D activities overseas because they want to ensure that employees working on - Industry and R&D are located in the same geographic vicinity.

The most common reason for sourcing overseas is the cost of components. In many cases, decreased Supply Chain & Logistics costs outweigh any added cost due to longer, more elaborate, or more unpredictable logistics. In general, the greater the contribution of labour to product cost, the greater the appeal of sourcing in low wage-rate countries. Another reason for sourcing in multiple countries is the sales and marketing advantage that can accrue to having a presence in, and making a contribution to, local economies.

Local trade restrictions may also cause - Industry to expand their supply base to additional countries. In recent conversations with several manufacturers of measurement equipment, we learned that unique country and / or trade-bloc approval systems created the need to maintain separate Supply Chain & Logistics. Mitigating the advantages of global sourcing is a set of factors that increase risk and cost. While few of these factors are solely a function of international sourcing, the greater the international dimension of a Supply Chain & Logistics, the greater the likelihood that these factors will be important:

- Increasingly Supply Chain & Logistics will bring:
- Increased system heterogeneity,
- Increased political complexity,
- Decreased legal security,
- More transportation modality changes,
- Greater delivery times and higher volumes, and
- New geopolitical concerns.

As uniformity decreases, there is a corresponding increase in the cost of maintaining and coordinating multiple systems. Systems are affected by laws, regulations, business culture, currency, and data and communication standards. Each of these can be unique to individual countries (or trading blocs). Thus, one consequence of international sourcing is that each new location carries the burden of accommodating several new systems. The multisystem coordination problem may compound in a nonlinear fashion because each new locale results in many new interfaces among multiple systems.

23. ECONOMIC IMPACT OF INADEQUATE INFRASTRUCTURE FOR SUPPLY CHAIN & LOGISTICS INTEGRATION:

As - Industry enters new territory, they are often faced with legal systems that do not adequately support the security needs of many business activities.

As international sourcing increases, the need for overseas transportation will follow, thus requiring goods to move from a ship or an airplane to a truck or train. Each transition increases cost, time, and the possibility of loss or damage. Additionally, international sourcing usually involves increased delivery times and high numbers of units per shipment. Both are attributable to reliance on sea transportation, a mode of transport that is slow and most economical with large volumes. These requirements are not conducive to business tactics such as vendor-managed inventory, just-in-time delivery, or mass customization.

Global sourcing requires dealing with political, social, and economic conditions. In the short term, these conditions may affect delivery and production schedules. In the longer term, they may undermine - Industry plans based on assumptions about assured supply and predictable costs. A second dimension to geopolitical concerns in sourcing is the need for government-to-government agreements as part of sourcing decisions. Another reason, though, is that governments may see these agreements as instruments of foreign policy.

24. SUPPLY CHAIN & LOGISTICS OPTIMIZATION IN PRACTICE:

- Access past orders and billing information,
- Track current orders,
- Initiate a new order, and
- Identify products being manufactured for other clients

25. FORECASTING MODELS

- These models allow prediction of demand based on past data or other parameters that are independently available. They enable better planning, given the lead-time necessary for response.

26. LOCATION MODELS

- These models identify the optimal location of facilities such as plants and warehouses, considering the inbound and outbound transportation costs as well as the fixed and variable costs of operation at the locations under consideration. These are usually formulated as Mixed Integer Programming Models.

27. DISTRIBUTION NETWORK DESIGN MODELS

- These models are usually comprehensive in nature, deciding between two, three and even four stages of distribution network, location of warehouses and break-bulk points, and sometimes even the transportation.
- Allocation Models
- These models help in optimally allocating commodities from sources to destinations in a multi-source, multi-destination environment. The costs considered for optimization are production costs and warehousing costs. The constraints considered can be due to demand, capacity, route restrictions, etc.

28. INVENTORY MODELS

- Inventory plays a major role in SCM.
- Inventory can be of various types such as:
- Batching and shipment inventories
- Buffer stocks to take care of uncertainties
- Pipeline inventory (primary and secondary transportation)

These models minimize the total relevant cost, based on trade-offs among, inter alia, inventory carrying cost, ordering cost, stock-out cost, transportation cost, taxes & duties, etc.

29. ROUTING MODELS

- These models allow optimal routing on a transportation network from a given source to a destination. The models used are the Shortest Path Problem, the Traveling Salesman Problem and the Vehicle Routing Problem. Decision Support Systems that interactively use the expertise of the decision maker by providing graphical support through a map (i.e., using a Geographical Information System) are also very useful in such decisions.

30. MOVING AHEAD BENEFITS:

Recognize that Supply Chain & Logistics management has different meanings in different industries. The importance of transportation cost or inventory or information technology can impact the design and operation of the logistics process.

Understand what each of customer wants and why. Each customer may have his own requirements. Reduce internal total logistics cycle time, with purchasing, - Industry, customer order and shipping, to have product ready and available for delivery to the customer.

Develop and communicate suppliers what you are doing, why you are doing it and what you expect of them. Learn their processes to help you design the best one.

Learn international supplier's operations and logistics cycle time.

An important part of reforming India's system must therefore be to make procurement information accessible to suppliers and purchasers alike. This will enhance planning, accountability and oversight.

Government's approach to procurement can be rules driven. There is a need to identify more intelligent ways to procurement to realize value for money, create opportunities and promote beneficial change.

A differentiated approach and the introduction of strategic sourcing that is a collaborative and structured process to critically analyze an organization's spending and using the information to make - Industry decisions about acquiring commodities and services more effectively. Strategic sourcing requires that government adopts a differentiated approach that looks at the strategic importance of the SCM as well as the supply market complexity.

31. LIMITATIONS:

The emergence of low-cost communications and information processing has made it possible for - Industry to revolutionize the way they operate internally, especially in distributing information throughout their organization on new and existing products, production and shipping schedules, engineering and technical requirements, and costs of - Industry and distribution. Through the use of - Industry and Enterprise Requirements Planning systems, they can operate with lower levels of inventory, can respond more quickly to changes in customer requirements, and can eliminate or outsource costly accounting functions.

A highly fragmented market, along with below par infrastructure and low IT penetration, resulting in acute operational efficiencies, Unfavorable modal mix which is skewed towards road as a major mode of transportation along with under utilization of other modes such as rail, coastal shipping, ports, etc. Lack of a unified regulatory logistics body for integrated planning at the Union level across shipping, road, aviation and warehousing segments, Lack of a focused plan in India to upgrade skill set in the wider Indian logistics landscape, Regulatory challenges including lack of policies to push development in coastal shipping, inland waterways and ports to develop these modes, which are not yet fully used.

32. CONCLUSION:

The much awaited introduction of GST talked about for so many years is long overdue. Introduction of GST may result in a simple, transparent and easy tax structure; merging all levies on goods and services into one GST, thereby bring uniformity in tax rates with only one or two tax rates across the entire supply chain. It also results in a good administration of tax structure and broadens tax base. Therefore early

implementation is good for business, industry and economy, and for sustaining high and inclusive growth in National Economy. India has witnessed an attractive growth story in the Logistics and Supply Chain sector, on the back of factors such as rapidly growing economy, increase in outsourcing of logistics, steady supply side changes, significant government investment in core infrastructure projects and landmark changes in tax and regulatory policies. The sector is experiencing a number of supply and demand side changes, which are carving a way for in numerous opportunities.

Considering the government's vision to uplift the Indian infrastructure and transportation sector to global standards, following are some aspects that were expected to provide an impetus to the sector. Focus on infrastructure development in the logistics industry to help organize the sector, boost private investment and accelerate the supply chain. Develop time-bound action plans to decongest airports and seaports, shift cargo-clearance activities to inland ports or airport locations, in addition to improving hinterland connectivity. Develop waterways and national logistics parks for faster and efficient movement of cargo Regulatory authority, Formalize a regulatory logistics body by uniting key policy stakeholders across ministries for an integrated approach towards project planning and development.

Rapid developments in information technology have many implications for the organization and management of transport and logistics. In this context, cooperation between actors in integrated supply chains becomes more and more important. To address this, the information and communication systems used for managing shipping and transport need to share information and the actors must be enabled to share that information according to their own business rules.

The competitive power in this environment will lie with a network of business partners who each bring the specific capabilities to bear. But the supply-chain activities of these partners must be tightly synchronised with the demands of the market place. That level of coordination requires not only the ability to communicate but also the capability to manage the complexity and immediacy of synchronisation. There are many potential pitfalls. The huge complexity in systems integration, which is fundamental for an efficient and workable supply-chain system that is integrated to other systems is surly a major issue.

Although it's still early days, these solutions should lead to better Supply Chain & Logistics management in India, reducing inefficiencies and increasing government realizations, as well as curbing food waste of the nation.

There has been a drastic increase in the pressure on organizations to find new ways to create and deliver value to customers through Supply Chain Management (SCM) and marketing initiatives. The goal of SCM and integration is to create unique competitive advantages by linking together customer values with a more effective flow of products. The

flow must always be refined and must create customer value proposition in a constantly changing market.

This paper provides an evaluation framework for measurement of performance improvement observed with integration of SCM and logistics.

The findings of this paper can further be strengthened by performance evaluation of key cross-functional and logistics. Being a conceptual paper, further research is required in this area to quantify the benefits of SCM and Logistics integration.

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