ISSN (Online) 2456 -1304

International Journal of Science, Engineering and Management (IJSEM)
Vol 3, Issue 11, November 2018

Operations Management Issues and Instructions of Logistics and Supply Chain Management(LSM)

Dr B. A. Satyamurthy, B.Tech, MBA, MPhil, PhD
Associate Professor, School of Management Studies, Maharajah's Postgraduate College, Vizianagaram

Abstract: **As a function with a strategic role, Logistics and Supply Chain Management (LSM) needs to continuously find ways to improve its efficiency and effectiveness. One potential way to specifically addressing efficiency target is to parts of the Operation management process. While operations management remains one of the most prevalent business practices in various areas, many businesses fail to realize the benefits anticipated from their operations management initiatives. Research reports that one major reason for these operations management challenges. There has been consensus operation management of that logistics as well as supply chain management is a vital research field, yet with few literature reviews on this topic. This paper sets out to propose some hot issues in the current research, through a review of related literature from the perspective of operations management. In addition, we generate some insights and future research. In this paper, we elaborate how the organizational design of the LSM function relates to Operations management opportunities in order to increase efficiency.**

Keywords: **Operations management, logistics and supply chain management.**

I. INTRODUCTION

Organizations adopt numerous business improvement methodologies to improve business performance. Logistics as well as supply chain management has been regarded to be the crucial factor for the companies to obtain competitive edge. In fact, logistics as well as supply chain management has received attention since the early 1980s, yet conceptually the management of supply chains is not particularly well understood, and many authors have highlighted the necessity of clear definitional constructs and conceptual frameworks on supply chain management. In this paper, we provide a tutorial on the current research of operations management of logistics and supply chain. We first clarify the conception of logistics and supply chain management in this paper, which defines the scope of our related research papers. The core of this paper is that we provide several hot issues in this field with examples to show how these researches contribute from different research angles. Finally, we conclude the paper with the insights obtained from our analysis and future study directions in this field. The paper is organized as follows. In the next section, we specify the definitions of the terms of logistics and supply chain used in our paper, with a comparison between these two popular conceptions. In Section 3, which is the core section of this paper, we provide several hot topics in current research with detailed examples. In Section 4, we provide insights and further research directions.

NEED FOR LOGISTICS MANAGEMENT

Today's organizations worldwide need logistics management more than ever because of the following:

i. Competitive Pressures,
ii. Information Technology,
iii. Channel Power and
iv. Profit Leverage.

SPIRITED PRESSURES: During the 1970s, logistics received more attention as a major cost driver to offset the effect of rising interest rates and increasing energy costs. In addition the logistics costs became more critical for many multinational companies because of globalization of their business. These developments affected logistics primarily in two ways: i) the growth of world-class competitors which has pressurised organizations to differentiate themselves and their product offerings. Logistics enable domestic firms to provide more reliable and responsive service to customers in the local markets than overseas competitors. ii) As firms increasingly buy and sell off-shore, the supply chain between the manufacturing firm and its supplier and customer firms becomes longer, costlier and more complex. Hence in such situations, excellent logistics is necessary to take advantage of global opportunities. Another factor strongly contributing to the increased emphasis and importance of logistics is the growing need for cost control to enable firms to compete better. The most important way / to improve a company's profitability is through cost reduction and cost control. Cost reduction• is rated as the most important issue for firms followed by issues such as quality and customer service.

All Rights Reserved © 2018 IJSEM

ISSN (Online) 2456 -1304

International Journal of Science, Engineering and Management (IJSEM)
Vol 3, Issue 11, November 2018

INFORMATION TECHNOLOGY: With the explosiori of information technology, organizations gained the ability to better monitor transaction intensive activities such as ordering, transportation (movement) and storage of goods and materials. Computerized quantitative models along with information technology increased the ability to manage material flows and to optimize inventory levels and movements. For example, systems such as material requirement planning (MRP I), distribution resource planning (DRP) and just-in-time (JIT) allowed firms to link many activities such as order processing, inventory management, forecasting and production scheduling. Many firms developed growing interest in logistics because of factors such as: a) advancements in information systems technology, b) higher emphasis on customer service, c) growing recognition of the systems approach and d) total cost concept. Profit leverage arising out of the application of logistics resulted in the realisation that logistics can be used as a strategic weapon in competing in the market place.

CHANNEL POWER: The channel power shifted from manufacturers to wholesalers, distributors and retailers. This has had a great impact on logistics. In major consumer good industries, when competition increases, many suppliers and manufacturers are forced out of competition and a few leading competitors remain in the market. Those who remain are highly competitive and are able to offer very high quality products. In the views of consumers, all of the leading brands are substitute for each other and lower brand loyalty decreases the manufacturer's power which in turn increases the retailer's power. Ultimately sales of consumer products are determined by what is in stock, and not by what particular brand offered to the customers.

PROFIT LEVERAGE: Any amount of money saved in logistics costs has a greater impact on the organization's profitability than a similar increase in sales revenue. Any savings in logistics costs directly adds to the company's profit. To achieve same amount of profit through sales, a firm has to put more effort and increase sales revenue considerably because profit earned through' sales is only a small per cent of sales revenue. Hence, a rupee saved in logistics is a rupee increase in the company's profit. Therefore, we can infer that logistics cost savings have much more leverage than an increase in sales.

SIGNIFICANCE AND SCOPE: Logistics is the management of the flow of goods between the point of origin and the point of consumption in order to meet some requirements, for example, of customers or corporations. The resources managed in logistics can include physical items, such as food, materials, animals, equipment, and liquids, as well as abstract items, such as time, information, particles, and energy. The logistics of physical items usually involves the integration of information flow, material handling, production, packaging, inventory, transportation, warehousing, and often security. The complexity of logistics can be modeled, analyzed, visualized, and optimized by dedicated simulation software. The minimization of the use of resources is a common motivation in logistics for import and export. Note that the above definition of logistics is not unified, although it might be indeed, in current environment, a commonly acknowledged one. For example, Council of Logistics Management (now renamed as Council of Supply Chain Management Professionals) referred to logistics as "the process of planning, implementing, and controlling the efficient, effective flow and storage of goods, services, and related information from point of origin to point of consumption for the purpose of conforming to customer requirements," which includes inbound, outbound, internal, and external movements and return of materials for environmental purposes. As we can see, the concept of logistics focuses on the product flow, which is the meaning by which this word has been translated in Chinese. It also puts emphasis on the activities of handling product, which include the storage, transportation, distribution, and packaging and processing. Although business logistics involves many activities, the traditional research of operations management on logistics mainly relates to the fields of logistics facility, transportation, and inventory planning. Supply Chain Compared to logistics, there appears to be even less consensus on the definition of the term "supply chain management." Kathawala and Abdou point out that SCM "has been poorly defined and there is a high degree of variability in people's minds about what is meant." Nevertheless, we present a rather widely adopted definition, which is given by Mentzer et al. which is rather broad, not confined to any specific discipline area, and adequately reflecting the breadth of issues that are usually covered under this term: "Supply chain management is defined as the systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole." The terms of "logistics" and "supply chain" are usually comparative in academy and industry, since both of them are closely relevant to the product circulation during its whole life cycle, and both have been regarded as the central unit of competitive analysis of model management science. Generally speaking, supply chain is a more broadened

All Rights Reserved © 2018 IJSEM

conception with a wider range which can involve other similar subjects, such as network sourcing, supply pipeline management, value chain management, and value stream management. In addition, we can see that the conception of logistics has no relationship with organization, which is the opposite of supply chain, since supply chain is made up of multiple organizations, usually companies. An important issue in supply chain management is that companies will not seek to achieve cost reductions or profit improvement at the expense of their supply chain partners but rather seek to make the supply chain as a whole more competitive. Hence, the contention that it is supply chains, and not a single company, that compete is a central tenet in the field of supply chain management. A central research methodology for supply chain management is game theory (and also incentive theory for the scenario of incomplete information).

PHYSICAL SUPPLY: Transportation, inventory maintenance, order processing, acquisinon, protective packaging, warehousing, materials handling, information maintenance and supply scheduling.

PHYSICAL DISTRIBUTION: Transportation, inventory maintenance, order processing, product scheduling, protective packaging, warehousing, materials handling and information maintenance.

COMPONENTS OF A TYPICAL LOGISTICS SYSTEM : According to the Council of Logistics Management, the components of a logistics system are customer service, demand forecasting, distribution communications, inventory control, aterial handling, order processing, parts and service support, plant and warehouse site selection, purchasing, packaging, return goods handling, salvage and scrap disposal, traffic and transportation and warehousing and storage.

DEVELOPMENT OF LOGISTICS: Even though logistics activity had been associated with the earliest forms of organised trade, it began to gain attention in the early 1900s as an area of study, in the distribution of farm products in the US, as a way to support the organization's business strategy and as a way of providing time and place utility. Further logistics contributed towards the Allied Victory in World War II and began to receive more recognition and emphasis. Military logistics provides the ability to efficiently and effectively distribute and store supplies and personnel which are the key factors in the success of armed forces of any country in the war. According to Peter Drucker, a noted business expert, a management consultant and an author of many books on management, "Logistics is one of the last frontiers of opportunity for organisations working to improve their corporate efficiency". Further to the application of logistics in military operations, deregulation of the transportation Industry in the late 1970s and early 1980s provided more options to organizations regarding the Modes of transportation they use and also increased the competition within and between transportation modes. Consequently, transport carriers became more creative, flexible, customer oriented and competitive for their survival and growth. As a result shippers now have more transportation options and they are in a position to negotiate on rate, terms and service and buy the best transportation services.

VALUE-ADDITION: Value of a product can be enhanced by four types of economic utility namely form utility, time utility, place utility and possession utility. 4anufacturing activities provide form utility (i.e., converting the raw materials into products of required shape and size), logistics activities provide time utility and place utility (i.e., providing the right product at the right place at the right time), and marketing activities provide the firm with possession utility.

These four types of utilities are;

a) Form Utility: Form utility refers to the value added to goods through a manufacturing or assembly process. When raw materials are combined to make a finished product, using a production process, value addition takes places in the form of form utility.

b) Place Utility: Logistics provides place utility by moving goods from production centres or warehouses (storage points) to points where demand exists. Logistics extends the physical boundaries of the market place, thus adding economic value to the goods. Logistics creates place utility through transportation. For example, moving finished goods from manufacturing plants to warehouses and then to retailers creates place utility (i.e., convenient and economical for customers to buy the goods they want in a nearby retail store).

c) Time Utility: It is not enough if the goods and services are made available where consumers need them. They must be made available at that point when customers demand them. This is known as time utility which means economic value is added to a good or service by having it sat demand point at a specific time (i.e., right time). Logistics creates time utility through proper inventory maintenance and through strategic location of goods and services (i.e., manufacturing plants / warehouse). For example, logistics creates time utility by having heavily advertised products available in retail stores at the time promised in the advertising copy. Also time utility can be created by moving the goods more quickly to a point of demand through the

All Rights Reserved © 2018 IJSEM

ISSN (Online) 2456 -1304

International Journal of Science, Engineering and Management (IJSEM)
Vol 3, Issue 11, November 2018

use of speedier mode of transportation. Time utility is more important today because of the increasing need to reduce lead time and inventory levels. This can be achieved through logistics related strategies such as JIT inventory control.

d) Possession Utility: Marketing activities related to the promotion of products or services create possession utility. Promotion, through direct or indirect contact with the customer, increases the desire in the customer to possess a good or to get the benefits from a service. Logistics helps marketers by creating place and time utility, which will lead to the creation of possession utility.

MISSION:

The mission of logistics management is to plan and co-ordinate all those activities necessary to achieve desired levels of delivered service and quality at the lowest possible cost. Hence logistics must be viewed as the link between the market place and the operating activity of the business. The following objectives of logistics management are to be achieved by a firm in order to fulfill its logistics mission:

(i) The primary or major objective is to efficiently and effectively move the inventory in the supply chain .in order to extend the desired level of customer service at the least possible cost.

(ii) The secondary objectives which facilitate achievement of the primary or major objective are:

(a) To reduce inventory to the minimum possible level.

(b) To achieve reliable and consistent delivery performance to enhance customer satisfaction and build long-term customer relationship.

(c) To achieve maximum economy in freight costs.

(d) To ensure minimum or no damage to products during transportation and storage.

(e) To ensure quick response to customer reqUirejts.

LOGISTICAL ACTIVITIES:

Logistics managers are responsible for the following activities: (i) Traffic and transportation, (ii) Materials handling, (iii) Warehousing and storage, (iv) Inventory control, (v) Industrial packaging, (vi) Order fulfillment, (vii) Demand forecasting, (viii) Plant and warehouse site location, (ix) Production planning, (x) Return goods handling, (xi) Purchasing, (xii) Parts and seryife support, (xiii)Customer service levels and (xiv) Salvage and scrap disposal. These activities are;

(i) Transportation: In a logistics system, the major focus is upon the physical movement or flow of goods or upon the network that moves the product. This network is composed of transportation agencies. The logistics manager selects the mode or modes of transportation used in moving the raw materials and finished goods,

(ii) Storage: It involves warehousing and inventory management which are closely related activities. A direct relationship exists between transportation and the level; of inventory and the number of warehouses required. Storage and transportation have a trade-off relationship between them. Firms which have slow means of transport need more warehousing space to keep higher inventory levels as compared to those using faster transport

(iii)Packaging: The type of transportation selected affects the packaging requirements both for moving a finished product to the market and for the inbound materials. Industrial packaging should be such that it protects the goods from damage during transportation especially through road, rail or ocean shipping.

(iv) Materials Handling: Material handling is crucial for efficient warehouse operation. Logistics Managers are responsible for movement of goods into a warehouse, storing them and moving the goods from storage to packing and shipping areas and for onward transportation to customers.

(v) Order Fulfillment: Order fulfillment consists activities involved with completing customer orders. Logistics ensures that the delivery lead time is reduced to the minimum in order to complete customer orders in time.

(vi) Inventory Forecasting: Accurate forecasting of inventory requirements and materials and parts are essential for effective inventory control, especially in firms using a just-in-time (JIT) or material requirement planning (MRP) approach to control inventory.

(vii) Production Planning: It is closely related to forecasting in terms of effective inventory control. Once the forecast is developed and the current inventory on hand and usage rate are assessed, production planning managers can determine the units to be produced to meet market demand. Production planning is integrated into logistics.

(viii) Purchasing: Purchasing or procurement is included in logistics because the transportation
cost relates directly to location of the supplier sources. In terms of transportation and inventorycosts, the quantities purchased would also affect logistics cst.

(ix) Customer Service: Customer service levels in many ways glue together other logistics areas. Decisions about inventory, transportation and warehousing relate to customer service requirements. Logistics plays an extremely important role in ensuring that the customer gets the right product at the right place and at the right time. Logistics decisions about product availability and inventory lead time are critical to customer service.

(x) Site Location: A change in the location of a

All Rights Reserved © 2018 IJSEM

ISSN (Online) 2456 -1304

International Journal of Science, Engineering and Management (IJSEM)
Vol 3, Issue 11, November 2018

manufacturing plant or a warehouse could alter time and place relationships between plants at.d markets or between supply points and plants. Such location changes will affect transportation cost and service, customer service, inventory requirements etc. Hence, transportation cost is frequently a very decisive factor in deciding on a location of a plant or a warehouse.

ROLE OF LOGISTICS IN SUPPLY CHAIN MANAGEMENT: A supply chain refers to the way that materials flow through different organizations, starting with raw materials and ending with finished products delivered to the ultimate consumer. Supply chain management can be viewed as a pipeline or conduit for efficient and effective flow of products/materials, services, information and money from supplier's suppliers through the various intermediate organizations out to the customer's customers. Supply chain management represents a logical extension of the logistics concept. It is also known as demand chain management, demand flow management, value chain management, value networks, and synchronisation management. The terms supply chain, demand chain, value chain or value network - all used as synonyms. As can be seen in the value chain illustration, inbound and outbound logistics are important primary components of the value chain, that is contributing "value" to the firm's customers and thereby making the firm financially viable. The outbound logistics involves physical distribution of

Exhibit: LOGISTICS SUPPLYCHAIN

finished goods (usually higher in value than raw materials). This means the finished goods inventory, warehousing, materials handling and packaging costs are higher than their raw material components. Hence the impact of transportation selection is more significant. The inbound logistics involves transportation of raw materials and component parts from suppliers to the firm, inventory requirements, warehousing, packaging and materials handling.

Logistics management added inbound logistics to the outbound logistics of physical distribution.

THE ROLE OF LOGISTICS IN THE ECONOMY: Logistics plays a key role in the economy in two ways: (i) Logistics is one of the major expenditures for businesses, thereby affecting and being affected by other economic activities, (ii) Logistics supports the movement and flow of many economic transactions and it is an important activity in facilitating the sale of virtually all goods and services. Logistics adds value by creating time utility and place utility. Utility represents the value or use fullness that an item or service has in fulfilling a want or need. Four types of utility are: form, possession, time and place utility. Time and place utility are supported by logistics. Time utility is the value added by having an item when it is needed. For example, all materials and parts that are needed for manufacturing must be available in time so that production line does not have to shut down because of shortage of materials and parts. Place utility means having the item or service available where it is needed. For example, if a product desired by consumers is in transit, in a warehouse or in another store, it does not create any place utility for them. Without both time and place utility which are directly supported by logistics, a customer could not be satisfied. In recent years, effective logistics management has been recognized as a key opportunity for the improvement of both the profitability and competitiveness of organisations. Because of the importance of "customer service" many organisations which were adopting "marketing concept" earlier, started re-examining what it meant to be "customer driven" organisation. The marketing concept is defined as a "marketing management philosophy which holds that achieving organisational goals depends on determining the needs and wants of target markets and delivering the desired satisfactions more effectively and efficiently than competitors". The four P's of the marketing mix require that for a firm to be successful, the marketing effort must integrate the ideas of having the right product, at the right price promoted with right promotion Mix and available in the right place.

ISSUES AND INSTRUCTIONS: Due to the extensive research ranges in operations management of logistics and supply chain management, we cannot possibly make a comprehensive review in one paper. In this section, we point out several of the most important issues and hot topics in recent research, which draws great attention from both academy and industry. Inventory and Transportation Management on Specific Fields. As has been pointed out in the previous section, the operations research on logistics management still mainly focuses on the traditional domain, that is, the inventory (including production planning) and transportation management. However, a noticeable phenomenon is that most papers are putting emphasis on specific fields with remarkable features captured into their models and thus making new contributions to the literature. For example, the inventory management of perishable products (also referred to as deteriorating product) is a rather old and mature field in logistics and supply chain management, with replenishment policies for inventory being the main focus of study. Whitin investigated such a

All Rights Reserved © 2018 IJSEM

problem, where fashion goods deteriorating at the end of certain storage periods were considered. Since then, considerable attention has been paid to this line of research. Nahmias provides a comprehensive survey of research published before the 1980s. Studies in recent years on the deteriorating inventory models can be found in Raafat and Goyal and Giri's papers, in which relevant literature published in the 1980s and 1990s is reviewed, respectively. A more updated review is given in Blackburn and Scudder's paper. However, new models can still be developed to capture the current management feature and obtain new managerial insights. Generally, two types of perishable loss, quantity loss and quality loss, may take place for a perishable product. The majority of the literature has dealt mainly with only one type of loss. In this regard, Cai et al. adopt a stochastic model to study a supply chain in which a distributor procures from a producer a quantity of a fresh product. During the transportation process, the distributor has to make an appropriate effort to preserve the freshness of the product, and his success in this respect impacts both the quality and quantity of the product delivered to the market. Cai et al. further extend the model into a Three-stage supply chain with outsourcing transportation involved. Another important field is transportation. It is generally known that the research on VRP (vehicle routing problem) and its various extensions has been extensive. However, other new domains on transportation can still be interesting topics. For example, the remarkable growth in intermodal transportation over the past decade has not been matched by a comparable level of academic activity, and, hence, the research on intermodal transportation appears to have a great potential. Chang explores one of the intermodal operational issues: how to select best routes for shipments through the international intermodal network. The problem is formulated as a multi objective multimodal multi commodity flow problem with time windows and concave costs, and an efficient heuristic is proposed. Vermaa and Verter present a first attempt for the development of an analytical framework for planning rail-truck intermodal transportation of hazardous materials by developing a bi objective optimization model to plan and manage intermodal shipments to represent the current practice; the routing decisions in the model are driven by the delivery times specified by the customers. Bruns and Knust study the problem of load planning for trains in intermodal container terminals. The objective is to assign load units to wagons of a train such that the utilization of the train is maximized and setup and transportation costs in the terminal are minimized. Bruns et al. further study the problem of robust load planning for trains in intermodal container terminals. The goal of load planning is to choose wagon settings and assign load units to wagons of a train such that the utilization of the train is maximized and setup and transportation costs in the terminal are minimized. Garc´ıa et al. adopt a new hybrid approach by combining OR techniques with AI search methods in order to obtain good quality solutions for complex intermodal transport problems, by exploiting the benefits of both kinds of techniques. The solution has been applied to a real-world problem from one of the largest Spanish companies using intermodal transportation.

SOURCING AND MARKETING IN SUPPLY CHAIN: Sourcing is the first step in a supply chain. The research on sourcing has been extensive in recent years. This leaves open room for a supplier to improve efficiency over time by further optimizing the production processes. In general, OEMs' shifting of more development and engineering work, which require complex tasks and customized products, to their suppliers implies a significant potential for a supplier to accumulate knowledge and experience from learning, thus reducing costs over time . This dynamic change of supply costs affects the negotiation of sourcing contracts. A noticeable issue is the utilization of auctioning in the sourcing strategy. One of the first researches in this regard might be Chen's which studies a procurement problem with one buyer and multiple potential suppliers who hold private information about their own production costs. An optimal procurement strategy is considered for the buyer who first specifies a payment for each possible purchase quantity and then invites the suppliers to bid for this contract. The auction can be conducted in many formats such as the English auction, the Dutch auction, the first-priced auction, sealed bid auction, and the Vickrey auction. Chen and Vulcano study a supply chain where an upstream supplier auctions his inventory or capacity as a bundle, which formulates the problem as a two-stage supply chain comprising a single supplier and two resellers. Huh and Janakiraman study periodic-review inventory replenishment problems with auctions and other sales channels and show that the optimality of (s, S) inventory replenishment policies extends well beyond the traditional sales environments studied so far in the inventory literature. Chen et al. study a supply chain in which a single buyer wishes to procure a package of products or services from various competing suppliers that possess private cost information and show how the buyer can optimize his/her profit and at the same time coordinate the channel by using a contract scheme involving auctions, audits, and profit sharing. For a supplier that provides critical and customized components, the demand closely depends on, and hence is susceptible to, the

All Rights Reserved © 2018 IJSEM

variation of the final product demand. In the automotive industry, unstable and uncertain domestic volume of individual models is cited as one of the biggest challenges faced by manufacturers due to increased consumer choices The consumer electronics industry is notorious for risk stemming from short product life cycles and high demand uncertainty. Furthermore, there is typically more uncertainty about the future demand than about the current demand. This demand uncertainty adds another source of future uncertainty, besides possible supplier switching (in a short-term relationship), that influences the decision of initial capacity investment. Marketing is another end in supply chain. The collaboration with marketing science massively extends the domain of supply chain management. Pricing, promotion, and channel management are the three most important areas in this regard. Pricing and promotion are the central issues in marketing management, let alone under consideration of the supply chain environment. Li and Graves explore the pricing decisions during intergenerational product transition, by formulating the dynamic pricing problem and deriving the optimal prices for both the old and new products. The optimal initial inventory for each product is also determined, and a heuristic method is discussed. Li and Zhang study the preorder strategy that a seller may use to sell a perishable product in an uncertain market with heterogeneous consumers. They find that accurate demand information may improve the availability of the product, which undermines the seller's ability to charge a high preorder price. As a result, advance demand information may hurt the seller's profit due to its negative impact on the preorder season. Sainathan considers pricing and ordering decisions faced by a retailer selling a perishable product with a two-period shelf life over an infinite horizon. Sinitsyn investigates the outcome of a price competition between two firms, each producing two complementary products. It is found that each firm predominantly promotes its complementary products together, which is correlationally supported by data in the shampoo and conditioner and in the cake mix and cake frosting categories. Liu et al. examine the efficacy of cost sharing in a model of two competing manufacturer-retailer supply chains who sell partially substitutable products that may differ in market size. Some counterintuitive findings suggest that the firms performing the advertising would rather bear the costs entirely if this protects their unit profit margin. Gao et al. show that the weather-conditional rebate program can increase sales by price discriminating among a customer's post purchase states. Taking advantage of the early sales, it can also reduce the inventory holding cost and ordering cost and hence can increase the retailer's expected profits. In addition, channel management is also an important interface between marketing and supply chain. Chen et al. study a manufacturer's problem of managing his direct online sales channel together with an independently owned bricks-and-mortar retail channel, when the channels compete in service. They identify optimal dual channel strategies that depend on the channel environment described by factors such as the cost of managing a direct channel, retailer inconvenience, and some product characteristics. Brynjolfsson et al. investigate local market structures for traditional retailers and then match these data to a dataset on consumer demand via two direct channels: Internet and catalog. Their analyses show that Internet retailers face significant competition from brick-and-mortar retailers when selling mainstream products but are virtually immune from competition when selling niche products. Guo investigates optimal disclosure strategies/formats in a channel setting with bilateral monopolies and shows that retail disclosure leads to more equilibrium information revelation. Chiang extends the single-period vertical price interaction in a manufacturer-retailer dyad to a multi period setting, in which a manufacturer distributes a durable product through an exclusive retailer to an exhaustible population of consumers with heterogeneous reservation prices. The open-loop, feedback, and myopic equilibria for this dynamic pricing game are explored and compared to the centralized solution.

GREEN LOGISTICS AND SUPPLY CHAIN: Green logistics refers to a logistics form which plans and implements green transport, green storage, green packaging, green circulation processing, green recovery, and other activities via advanced logistics technology. It aims to reduce environmental pollution and resource consumption arising from logistics activity so as to realize a "win-win" consequence in logistics development and eco-environmental conservation. As an important avenue for realizing the sustainable development strategy, greater attention has been given to green logistics which will play an important role in industrial upgrading, transformation of economic structure, promotion of logistics development level, and other relevant aspects. Green supply chain is the supply chain management with similar objectives and core implications. Green logistics as well as supply chain management is also usually referred to "sustainable" management. A typical field in green logistics and supply chain management is reverse logistics, sometimes called closed-loop supply chains, in which there are reverse flows of used products (postconsumer) back to manufacturers. There has been substantial research into production planning

All Rights Reserved © 2018 IJSEM

and inventory management in remanufacturing systems. Simpson first studies a periodic review inventory system with stochastic and mutually dependent demands and returns and provides the optimality of a three-parameter inventory policy. Kelle and Silver consider a different model with independent demand and return processes, where all returned products should be remanufactured. Inderfurth shows that the optimal policy derived by Simpson is still optimal in the case of fixed cost when lead times for remanufacturing and manufacturing are identical. Van der Laan et al. analyze a push control strategy and a pull control strategy in a hybrid system and compare them with the traditional systems without remanufacturing. Teunter et al. explore the superior inventory strategies for hybrid manufacturing/remanufacturing systems with a long lead time for manufacturing and a short lead time for remanufacturing. Wang et al. analyze the impacts of the amount of products manufactured and the proportion of the remanufactured part to the returned products on the total cost of the hybrid system, showing that the cost could be reduced significantly if these two critical values are optimally set. Other related works include Kiesmuller, Tang and Grubbstrom, Aras et al. For a comprehensive review, I refer the reader to Fleischmann et al., Dekker et al., and Ilgin and Gupta. A typical feature in reverse logistics and closed-loop supply chains is the quality uncertainty of acquired used product, which is usually expressed by a random remanufacturing yield and has been studied in some recent papers. Inderfurth shows that the uncertainty in returns and demand can be an obstacle to an environmental-benign recovery strategy within a reverse logistics system. Inderfurth and Langella develop heuristics for the problem of obtaining parts for remanufacturing by disassembling used products or procuring new ones, under the consideration of random disassembly yields. Galbreth and Blackburn explore acquisition and sorting/remanufacturing policies in the case of a continuum of quality levels for cores with fixed quality distribution. The main premise is that remanufacturing costs will go down if only the returned products with better quality are remanufactured. Ketzenberg et al. explore the value of information in the context of a firm that faces uncertainty with respect to demand, product return, and product remanufacturing yield by first analyzing a simple single-period model and then proving that the results carry over multiperiod setting. C¸ orbacioglu and van der Laan analyze a two-product system with end-product stock containing both manufactured and remanufactured products while the remanufacturable stock may contain products of different quality. Zikopoulos and Tagaras investigate the production problem in a reverse supply chain consisting of two collection sites and a refurbishing site and examine how the profitability of reuse activities is affected by uncertainty regarding the quality of returned products. Denizel et al. propose a stochastic programming formulation to solve the remanufacturing production planning problem when inputs of the remanufacturing system have different and uncertain quality levels and capacity constraints. Although the research on remanufacturing systems is vast, there are only a few papers that consider a market-driven acquisition channel for used products. Guide and Jayaraman and Guide and van Wassenhove are the first to investigate this field, pointing out the importance of used product acquisition management to deal with the uncertainty in timing, quantity, and quality of the returned products. Guide et al. develop a quantitative model to determine the optimal acquisition prices of used products and the selling price of remanufactured products, assuming that the quantity of return items can be fully controlled by the acquisition price. Bakal and Akcali extend the model of Guide et al. in to the case of random remanufacturing yield and analyze the impact of yield on the remanufacturing profitability. Karakayali et al. study the problem of determining the optimal acquisition price of the end-of-life products and the selling price of the remanufactured parts under centralized as well as decentralized remanufacturer-driven and collector driven decentralized channels.

CONSUMERS' BEHAVIOR: The decisions under the consumers' behavior are important for the firms to gain competitive edge and obtain more profit. The customer's behavior can be loss averse, risk averse, regretful, and strategic, and the papers incorporating such factors are regarded as increasingly important. Kok and Xu study assortment planning and pricing for a product category with heterogeneous product types from two brands by modeling consumer choice using the nested multinomial logit framework with two different hierarchical structures: a brand-primary model in which consumers choose a brand first and then a product type in the chosen brand and a type-primary model in which consumers choose a product type first and then a brand within that product type. Nasiry and Popescu study the dynamic pricing implications of a new, behaviorally motivated reference price mechanism based on the peak-end memory mode, which suggests that consumers anchor on a reference price that is a weighted average of the lowest and most recent prices. They find that a range of constant pricing policies is optimal for the corresponding dynamic pricing problem. Nasiry and Popescu further characterize the effect of anticipated regret on consumer decisions and on firm profits and policies in an advance

All Rights Reserved © 2018 IJSEM

selling context where buyers have uncertain valuations. Tereyagoˇ glu and Veeraraghavan ˇ propose a model that addresses pricing and production decisions for a firm, using the rational expectations framework. They show that firms may offer high availability of goods despite the presence of conspicuous consumption and scarcity strategies are harder to adopt as demand variability increases. Parlakturk considers a firm that sells two vertically (quality) differentiated products to strategically forward-looking consumers over two periods, setting the prices dynamically in each period. It is found that the loss due to strategic customer behavior can be less with two product variants compared to the single-product benchmark, which indicates that product variety can serve as a lever when dealing with strategic customers. Cachon and Swinney consider a retailer that sells a product with uncertain demand over a finite selling season, with three types of consumers: myopic, bargain-hunting, and strategic consumers. They find that the retailer stocks less, takes smaller price discounts, and earns lower profit if strategic consumers are present than if there are no strategic consumers, and a retailer should generally avoid committing to a price path over the season. Another stream of research focuses on the risk attitude of the firms in the supply chain. Lau's might be the first piece of work that studies the newsvendor boy problem under mean-variance framework, which takes the variance of system profit or cost into the utility function. Other recent works employing similar methodology to investigate supply chain problem include H. S. Lau and A. H. L. Lau on supply chain model with return policy, Buzacott et al.on the commitment-option contracts, Choi et al.on channel coordination, and Wei and Choi on wholesale pricing and profit sharing scheme.

II. CONCLUSION

Logistics management is concerned with creation of value for customers, suppliers and stake holders of the firm. Logistics creates time and place utility or value for the customers by making Available the products customers need at the time and place desired by the customers. Good logistics management views each activity in the supply chain as contributing to the process of adding value. From the report, we can absorb the following issues and future directions in the area of operations research of logistics and supply chain management. First, the logistics issue regarding the people's livelihood becomes a hot spot. The traditional research in this regard is related to perishable product, fashion product, and electronic product, which have short life cycle. Nowadays, such topics might include city logistics, emergency logistics, and agriculture supply chain. Second, new directions on logistics and supply chain management can be brought about by the development of economy and technology. A typical example is the information technology which leads to the research on e-business and related distribution channel choice. Nowadays, the common usage of RFID, cloud technique, and big data can be important research directions for future study. Third, the environmental related research will continue to be big issue. With the steady increase in global population and economic scale, resource crisis, ecological damage, environmental pollution, and other issues have drawn universal concern. It has been the consensus of the international community to attain socioeconomic sustainable development through a greener economic pattern and lifestyle. Many countries create a new outlook in industrial and technical competition by increasing investment in the green logistics and supply chain field, formulating and implementing various bills, plans, and strategies, and strengthening the implementation of green economic development strategy. In the future, the range of this topic will not only be just remanufacturing, reverse logistics, and closed-loop supply chain. Low-carbon issues can be an important research direction. Finally, multimethodology is an important direction for future study. Traditionally, major research methodologies in operations management can be classified into several categories, such as theoretical modeling, computation and simulations, surveys, cases, event studies, and behavioral experiments. In recent years, there is an emerging trend towards combining multiple research methodologies to explore research problems in logistics and supply chain management. For example, in addressing the issues of supply chain coordination, some papers establish the respective models and verify the findings by real-world cases and some papers conduct behavioral experiments with the goal of exploring the real-world relevance of some theoretical models. Moreover, the number of the papers with new applications of the existing methodology, such as cooperative game and behavior operations, is expected to grow continuously.

REFERENCES

1. M. J. Saunders, Strategic Purchasing and Supply Chain Management, Pitman, London, UK, 1997.

2. E. van der Laan, M. Salomon, R. Dekker, and L. van Wassenhove, "Inventory control in hybrid systems with remanufacturing," Management Science, vol. 45, 1999.

3. H. S. Lau and A. H. L. Lau, "Manufacturer's pricing

All Rights Reserved © 2018 IJSEM

strategy and return policy for a single-period commodity," European Journal of Operational Research, vol. 116, no. 2, pp. 291–304, 1999.

4. S. Croom, P. Romano, and M. Giannakis, "Supply chain management: an analytical framework for critical literature review," European Journal of Purchasing and Supply Management, vol. 6, no. 1, pp. 67–83, 2000.

5. S. K. Goyal and B. C. Giri, "Recent trends in modeling of deteriorating inventory," European Journal of Operational Research, vol. 134, no. 1, pp. 1–16, 2001.

6. J. T. Mentzer, W. DeWitt, J. S. Keebler et al., "Defining supply chain management," Journal of Business Logistics, vol. 22, 2001.

7. T. R. Lewis and H. Yildirim, "Managing dynamic competition," The American Economic Review, vol. 92, no. 4, pp. 779–797, 2002.

8. Y. K. Kathawala and K. Abdou, "Supply chain evaluation in the service industry: a framework development compared to manufacturing," Managerial Auditing Journal, vol. 18, 2003.

9. J. Buzacott, H. Yan, and H. Zhang, "Risk analysis of commitment-option contracts with forecast updates," Working Paper, York University, Toronto, Canada, 2003.

10. R. Dekker, M. Fleischmann, K. Inderfurth, and L. N. van Wassenhove, Reverse Logistics: Quantitative Models for ClosedLoop Supply Chains, Springer, New York, NY, USA, 2004.

11. J. Gray, B. Tomlin, and A. Roth, "The effect of learning and strategic behavior on manufacturing outsourcing decisions,Working Paper, Kenan-Flagler Business School, University of North Carolina, 2005.

12. R. Monczka, R. Trent, and R. Handfield, Purchasing and Supply Chain Management, Thomson South-Western, Mason, Mich, USA, 2005.

13. B. Anderson, "GM's global supply footprint," in Proceedings of the Supplier Industry in Transition: The New Geography of Auto Production, 2006.

14. B. Liu, G. Cai, and A. A. Tsay, "Advertising in asymmetric competing supply chains," Production and Operations Management.

15. F. Chen, "Auctioning supply contracts," Management Science, vol. 53, no. 10, pp. 1562–1576, 2007.

16. T. S. Chang, "Best routes selection in international intermodal networks,"Computers and Operations Research, vol. 35, no. 9, pp. 2877–2891, 2008.

17. [11] J. Blackburn and G. Scudder, "Supply chain strategies for perishable products: the case of fresh produce," Production and Operations Management, vol. 18, 2009.

18. Y. J. Chen and G. Vulcano, "Effects of information disclosure under first- and second-price auctions in a supply chain setting," Manufacturing and Service Operations Management, vol. 11,2009.

19.] M. A. Ilgin and S. M. Gupta, "Environmentally conscious manufacturing and product recovery (ECMPRO): a review of the state of the art," Journal of Environmental Management, vol. 91, 2010.

20. [43] J.Wang, J. Zhao, and X.Wang, "Optimum policy in hybrid manufacturing/remanufacturing system," Computers and Industrial Engineering, vol. 60, 2011.

21. N. Tereyagoˇ glu and S. Veeraraghavan, "Selling to conspicuous ˇ consumers: pricing, production, and sourcing decisions," Management Science, vol. 58, 2012.

22. [16] F. Bruns and S. Knust, "Optimized load planning of trains in intermodal transportation," OR Spectrum, vol. 34, no. 3, pp. 511– 533, 2012.

23. [29] H. Li and S. C. Graves, "Pricing decisions during intergenerational product transition," Production and Operations Management, vol. 21, no. 1, pp. 14–28, 2012.

[24]. R. Lamming and J. Hampson, "The environment as a supply chain management issue," The British Journal of Management, vol. 7, supplement 1, pp. S45–S62, 1996.

[25]. M. J. Saunders, "Making strategic decisions and actions in purchasing and supply chain management," in Proceedings of the 6th International IPSERA Conference, pp. T1/6 1–T1/6 9, Naples, Italy, 1997.

[26]. S. Nahmias, "Perishable inventory theory: a review," Operations Research, vol. 30, no. 4, pp. 680–708, 1982.

All Rights Reserved © 2018 IJSEM

[27] F. Raafat, "Survey of literature on continuously deteriorating inventory models," Journal of the Operational Research Society, vol. 42, no. 1, pp. 27–37, 1991.

[28] X. Q. Cai, J. Chen, Y. B. Xiao, and X. L. Xu, "Optimization and coordination of fresh product supply chains with freshness keeping effort," Production and Operations Management, vol. 19, no. 3, pp. 261–278, 2010.

[29] X. Q. Cai, J. Chen, Y. B. Xiao, X. L. Xu, and G. Yu, "Fresh-product supply chain management with logistics outsourcing," Omega, vol. 41, no. 4, pp. 752–765, 2013.

[30] M. Verma and V. Verter, "A lead-time based approach for planning rail-truck intermodal transportation of dangerous goods," European Journal of Operational Research, vol. 202, no. 3, pp. 696–706, 2010.

[31] F. Bruns, M. Goerigk, S. Knust, and A. Schobel, "Robust load ¨ planning of trains in intermodal transportation," OR Spectrum, vol. 1, pp. 1–38, 2013.

[32]. J. Garc´ıa, J. E. Florez, A. Torralba et al., "Combining linear pro- ´ gramming and automated planning to solve intermodal transportation problems," European Journal of Operational Research, vol. 227, no. 1, pp. 216–226, 2013.

[33] W. T. Huh and G. Janakiraman, "Inventory management with auctions and other sales channels: optimality of (s, S) policies," Management Science, vol. 54, no. 1, pp. 139–150, 2008.

[34] K.-Y. Chen, M. Kaya, and O. ¨ Ozer, "Dual sales channelman- ¨ agement with service competition," Manufacturing and Service Operations Management, vol. 10, no. 4, pp. 654–675, 2008.Y. J. Chen, S. Seshadri, and E. Zemel, "Sourcing through auctions and audits," Production and Operations Management, vol. 17, no. 2, pp. 121–138, 2008.

[35] J. Carbone, "What buyers look for in contract manufacturers," Purchasing, vol. 128, no. 4, pp. 32–38, 2000.

[36] C. Li and F. Zhang, "Advance demand information, price discrimination, and preorder strategies," Manufacturing and Service Operations Management, vol. 15, no. 1, pp. 57–71, 2013.

[37] A. Sainathan, "Pricing and replenishment of competing perishable product variants under dynamic demand substitution," Production and Operations Management, vol. 22, no. 5, pp. 1157– 1181, 2013.

[38] M. Sinitsyn, "Coordination of price promotions in complementary categories," Management Science, vol. 58, no. 11, pp. 2076– 2094, 2012.

[39] F. Gao, O. C. Demirag, and F. Y. Chen, "Early sales of seasonal products with weather-conditional rebates," Production and Operations Management, vol. 21, no. 4, pp. 778–794, 2012.

[40] E. Brynjolfsson, Y. Hu, and M. S. Rahman, "Battle of the retail channels: how product selection and geography drive crosschannel competition," Management Science, vol. 55, no. 11, pp. 1755–1765, 2009.

[41] L. Guo, "Quality disclosure formats in a distribution channel," Management Science, vol. 55, no. 9, pp. 1513–1526, 2009.

[42]. W.-Y. K. Chiang, "Supply chain dynamics and channel efficiency in durable product pricing and distribution," Manufacturing and Service Operations Management, vol. 14, no. 2, pp. 327–343, 2012.

[43] K. Inderfurth, "Simple optimal replenishment and disposal policies for a product recovery system with leadtimes," OR Spectrum, vol. 19, no. 2, pp. 111–122, 1997.

[44] R. Teunter, E. van der Laan, and D. Vlachos, "Inventory strategies for systems with fast remanufacturing," Journal of the Operational Research Society, vol. 55, no. 5, pp. 475–484, 2004.

[44] G. P. Kiesmuller, "A new approach for controlling a hybrid ¨ stochastic manufacturing/remanufacturing system with inventories and different leadtimes," European Journal of Operational Research, vol. 147, no. 1, pp. 62–71, 2003.

[45] O. Tang and R. W. Grubbstrom, "Considering stochastic lead ¨ times in a manufacturing/remanufacturing system with deterministic demands and returns," International Journal of Production Economics, vol. 93-94, no. 1, pp. 285–300, 2005.

[46] N. Aras, V. Verter, and T. Boyaci, "Coordination and

All Rights Reserved © 2018 IJSEM

priority decisions in hybrid manufacturing/remanufacturing systems," Production and Operations Management, vol. 15, no. 4, pp. 528– 543, 2006.

[47] M. Fleischmann, J. M. Bloemhof-Ruwaard, R. Dekker, E. van der Laan, J. A. E. E. van Nunen, and L. N. van Wassenhove, "Quantitative models for reverse logistics: a review," European Journal of Operational Research, vol. 103, no. 1, pp. 1–17, 1997.

[49] K. Inderfurth, "Impact of uncertainties on recovery behavior in a remanufacturing environment: a numerical analysis," International Journal of Physical Distribution and Logistics Management, vol. 35, no. 5, pp. 318–336, 2005.

[51] K. Inderfurth and I. M. Langella, "Heuristics for solving disassemble-to-order problems with stochastic yields," OR Spectrum, vol. 28, no. 1, pp. 73–99, 2006.

[52] M. R. Galbreth and J. D. Blackburn, "Optimal acquisition and sorting policies for remanufacturing," Production and Operations Management, vol. 15, no. 3, pp. 384–392, 2006.

[53] M. E. Ketzenberg, E. A. van der Laan, and R. H. Teunter, "Value of information in closed loop supply chains," Production and Operations Management, vol. 15, no. 3, pp. 393–406, 2006. [

54] U. C¸ orbacioglu and E. A. van der Laan, "Setting the holding ˘ cost rates in a two-product system with remanufacturing," International Journal of Production Economics, vol. 109, no. 1-2, pp. 185–194, 2007.

[55] C. Zikopoulos and G. Tagaras, "Impact of uncertainty in the quality of returns on the profitability of a single-period refurbishing operation," European Journal of Operational Research, vol. 182, no. 1, pp. 205–225, 2007.

[56] M. Denizel, M. Ferguson, and G. C. Souza, "Multiperiod remanufacturing planning with uncertain quality of inputs," IEEE Transactions on Engineering Management, vol. 57, no. 3, pp. 394–404, 2010.

[57] V. D. R. Guide Jr. and V. Jayaraman, "Product acquisition management: current industry practice and a proposed framework," International Journal of Production Research, vol. 38, no. 16, pp. 3779–3800, 2000.

[58] V. D. R. Guide Jr. and L. N. vanWassenhove, "Managing product returns for remanufacturing," Production and Operations Management, vol. 10, no. 2, pp. 142–155, 2001. [59] V. D. R. Guide Jr., R. H. Teunter, and L. N. van Wassenhove, "Matching supply and demand to maximize profits from remanufacturing," Manufacturing and Service Operations Management, vol. 5, no. 4, pp. 303–316, 2003.

[60] I. S. Bakal and E. Akcali, "Effects of random yield in remanufacturing with price-sensitive supply and demand," Production and Operations Management, vol. 15, no. 3, pp. 407–420, 2006.

[61] I. Karakayali, H. Emir-Farinas, and E. Akcali, "An analysis of decentralized collection and processing of end-of-life products," Journal of Operations Management, vol. 25, no. 6, pp. 1161–1183, 2007.

[62] A. G. Kok and Y. Xu, "Optimal and competitive assortments ¨ with endogenous pricing under hierarchical consumer choice models," Management Science, vol. 57, no. 9, pp. 1546–1563, 2011.

[63] J. Nasiry and I. Popescu, "Dynamic pricing with loss-averse consumers and peak-end anchoring," Operations Research, vol. 59, no. 6, pp. 1361–1368, 2011.

[64] J. Nasiry and I. Popescu, "Advance selling when consumers regret," Management Science, vol. 58, no. 6, pp. 1160–1177, 2012.

[66] A. K. Parlakturk, "The value of product variety when selling to ¨ strategic consumers," Manufacturing and Service Operations Management, vol. 14, no. 3, pp. 371–385, 2012.

[67] G. P. Cachon and R. Swinney, "Purchasing, pricing, and quick response in the presence of strategic consumers," Management Science, vol. 55, no. 3, pp. 497–511, 2009.

[68] H. S. Lau, "The newsboy problem under alternative optimization objectives," Journal of the Operational Research Society, vol. 31, no. 6, pp. 525–535, 1980.

[71] T. M. Choi, D. Li, H. Yan, and C.-H. Chiu, "Channel coordination in supply chains with agents having mean-variance objectives," Omega, vol. 36, no. 4, pp. 565–576, 2008.

[72] Y. Wei and T. M. Choi, "Mean-variance analysis of supply chains under wholesale pricing and profit sharing schemes," European Journal of Operational Research, vol. 204, no. 2, pp. 255–262, 2010.

All Rights Reserved © 2018 IJSEM