

INFORMATION SYSTEMS (IS) IN THE SUPPLY CHAIN MANAGEMENT (SCM): A CASE OF LIQUEFIED PETROLEUM GAS (LPG) OF BANGLADESH

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Abstract: Flow of Information has become a crucial function in setting objective, drawing strategy, taking right decision regarding supply chain of LP Gas throughout the whole country by linking the supplier, manufacturer, distributor, dealer/retailer and customer to achieve optimum productivity, overall satisfaction and joyful relationship at competitive costing. As LP Gas is a necessary commodity, quick and effective information system helps a manager to understand the customer response, their demand, inventory in stock, amount to be produced, time frame and location of delivery. Here we used multi-method to get the best result. We have collected data from 152 respondents in the relevant field. This paper illustrated the role of IS in sourcing, network designing, transportation, inventory management, forecasting, aggregate planning, setting goal, benchmarking the goal, troubleshooting from very beginning of the supplier relationship to the end customer relationship keeping smooth internal information flow throughout the process.

Key Words: Liquefied Petroleum Gas (LPG), Supply Chain Management (SCM), Supplier Relationship Management (SRM), Customer relationship Management (CRM)

1.0 Introduction:

A supply chain is the set of value adding activities connecting the enterprise's suppliers and its customers. The principle of supply chain activity is receiving input from firm's suppliers – add value – deliver to customers (Chopra and Meindl, 2010). To achieve effective supply chain integration, the firms need to implement information technology (Handfield and Nichols, 1999); Sufian (2010). Brandyberry et al. (1999) suggested that by using technology of information, the firms could manage the flow and impact of numerous supply chains dimension, such as quality, cost, flexibility, delivery, and profit. Byrd and Davidson (2003) found that information technology impact the supply chain effectiveness.

Previous research shows that unless the firm integrates information systems with its major supply chain partners to allow for more information and data sharing, the firm will hardly stay competitive in the market in the long run (Hult et al., 2007). A healthy and collaborative information system fosters the entire supply chain to be more responsive to opportunities and threats arising from customers and competitors (Richardson, 1990; Bowersox et al., 1999; Kim et al., 2006).

After being produced from crude oil in refinery, LPG is stored in storage tank in the terminal and then bottled inside the cylinder which reaches to the end user through the distributors and dealers/ retailers spread all over the country by the four private companies (Omera LPG, Basundhara LP Gas Ltd, Premier LP Gas Limited, Jamuna Spacetech Joint Venture Limited) as per their own business strategies beside BPC, the only Government owned LP Gas Company in Bangladesh (Authors).

Analyzing the future aspect and business growth of the business, other private companies have shown keenness to set up LPG bottling plant whereas the prevailing companies who have already 6-8% business growth per year are trying to boost up their business more vigorously by making new satellite terminal, Regional Distribution Point (RDC), developing new technologies (for example, LPG driven automobiles), increasing product range (Cylinder banking technology, Vaporizer, SNG, LNG), strengthening their distribution network, creating customer loyalty to their brand by launching diverse programs (Chowdhury, 2012).

In Bangladesh, 92% people are familiar with Biomass as cooking fuel among the 70% people who are leaving in bucolic areas (M.Tanim, 2013). About 6% of the entire inhabitants use NG for cooking purpose whereas around 68% power generation is dependent on NG that still can't serve power to 75% of the rural people (M.Elahi, 2013). For the fact, LPG as an alternative fuel is becoming popular day by day. But still people are not conversant of the product, its advantages. Strong Supply chain is the vertebrae to reach the product to the aimed patron which is unattainable without a smooth Information System.

Supply Chain Information System is an organized combination of people, hardware, software, communications networks, and data resources that stores, retrieves, transforms, and disseminates information in an organization's people, activities, information, and resources involved in moving a product or service from supplier to customer.

To reduce the pressure on NG from domestic usage so that it can be used in power sector and to lessen the usage of Biomass which is a menace for the environment, it is an obvious to flourish LPG market all over the country.

2.0 Literature Review:

Supply chain is defined as a set of activities for forwarding a product or a service (Semchi-Levi, 1999). Petroleum and Gas supply chain can be divided into upstream and downstream process. Upstream process means receiving raw materials from suppliers before it goes for further manufacturing and downstream process means getting goods from manufacturing division and serving it to the targeted consumers (Chopra 2010).

Ajay Selot (2009) studied that, natural gas supply chain planning, coordinating and optimization is important to ensure security, safety and reliability of natural gas supply. And, it is challenging due to the technical and distinctive features of natural gas supply chains. These distinctive features arise from the low volumetric energy density of natural gas and the significance of gas quality and pressure in supply chain operations. Agreements and contracts play a vital role in the entire supply chain due to high capital cost, specificity and investment risks associated with gas infrastructure.

Raslavicius, L. et al. (2014) discussed that, the last 20–25 years has been due to pressure from emission standards and fuel based economy requirements becoming ever stricter. These rules and regulations have equally influenced the all stages (from 1st to 5th generation) of LPG technology development while looking earlier and back in retrospective. Here, Increasing emphasis on liquefied petroleum gas (LPG) can provide, relatively low in cost and abundant energy source to provide affordable and available fuel-efficient transportation. It is possible to achieve the best results in vehicle power, fuel efficiency and low gaseous waste products.

Dehning et al (2007) examined the financial benefits of information technology investments around newly adopted IT-based supply chain management (SCM) systems by 123 manufacturing firms over the period 1994–2000. They form hypotheses using the value chain to specify the expected financial impact of SCM systems. By examining the

change in financial performance pre- and post-adoption controlling for industry median changes in performance, they find that SCM systems increase gross margin, inventory turnover, market share, return on sales, and reduce selling, general, and administrative expenses.

Information and communication systems are widely recognized to be an effective approach to manage supply chains under disruptions (Blos et al., 2009). It can contribute and well improve flexibility of supply chains (Skipper and Hanna, 2009). The important benefits can be achieved if information is provided in advance. Li et al. (2006) find out that by timely communicating and sharing of information at downstream, upstream disruptions and distortion may be quickly avoided or their negative consequences solved. Tomlin (2006) recommended that advance and prior information could be used to deal with certain risks, solve labor disputes: if a firm can develop advance information systems in decision making process, that a strike is imminent then mitigation inventory may be built in advance (Tomlin, 2006)

3.0 Objective:

The main objective of the paper is to find the information gap in supply chain process of LPG business in Bangladesh and recommending some techniques to develop the information system as a cost and time reduction tool in supply chain process.

3.1 Arguments Development:

1. Supply Chain Management = Supplier Management+ Internal Supply Chain Management+ Customer Management
2. Output of any process/information = Input for the next process. Supplier may supply either product or information to the next step.
3. Downstream business process has been discussed elaborately in the paper considering no problem in the upstream business process.

3.2 Methodology:

This research is primarily on IT's role in SCM of LPG industry which are complex, dynamic and not well understood, the multi-method approach was adopted in the fieldwork and also for analyzing collected data.

3.2.1 Sampling Procedure

This study consisted of 152 respondents. These respondents were selected from different LPG industry of Bangladesh. They are working in different departments like, IT, Finance, Marketing etc.

3.2.2 Questionnaire Development and Pre-testing

In this study, to achieve objectives properly we developed a semi-structured interview schedule for collecting the information from the sample population. All measures were anchored on a 5 point Likert scale. Several experienced SCM researchers reviewed the instrument i.e interview schedule. At first the draft questionnaire was prepared. The initial questionnaire was pre-tested and necessary correction was made before finalize it.

3.2.3 Data Collection:

The study is compiled with the help of both primary and secondary data. The primary data collected from the respondents on the basis of interview schedule through personal interview. The study was conducted during the period from September 2014 to December 2014. As data collection began, a combination of opportunistic and snowball sampling (A snowball sample is one in which the researcher collects data on the few members of the target population he or she can locate, then asks those individuals to provide information needed to locate other members

of that population whom they know) was followed. Moreover, we have done the desk study which is covered various published and unpublished articles, materials and various documents for study purpose.

3.2.4 Data Analysis:

In the study, we analyze our data by employing descriptive statistics and Cronbach's alpha test. For the study, the entire analysis is done by personal computer (PC). A well known statistical package SPSS (Statistical Package for Social Sciences) 20 Version was used in order to analyze the data.

4.0 LPG Business Process and its Supply Chain:

LPG is produced from crude oil after successive refining process. In Bangladesh, we have already 2 No's of refinery plants. But the quality of LP gas is not that much good. Most of the private companies import gas from Vietnam, Philippines, Singapore, Thailand and so on. The price of LP Gas fluctuates in international market according to contract price (CP). Each of the private companies has their own terminal, some have Regional Distribution Point (RDC) or satellite plant. They place order and bring ship from abroad as per their consumption and inventory analysis of the terminal. LP Gas is stored in specially designed storage tank of very high capacity. In Bangladesh most of the plants are located beside the port for smooth ship unloading from jetty. LPG bottles are either manufactured in Bangladesh or brought from abroad. These bottles are filled in the plant with filling machine imported from German, Malaysia, French suppliers (Authors).

In Bangladesh, the cylinder gas users are classified into 3 categories, domestic user, commercial user and industrial bulk user. For the Industrial customer, LPG is transported by road tankers. LPG filling station i.e. Autogas is another great market of LPG. Automobiles can be driven by LPG which is a very new technology in Bangladesh. Only Petregaz has installed 8Nos of Autogas Station all over Bangladesh. Bashundhara has also installed one Station at Jessore. The supply chain of the Autogas Station is maintained by the road tankers which are refilled once or twice in a week as per requirement. Also in some industries that are not getting proper NG, are using LPG by installing a tank as per their consumption & refilling it on consumption basis (Saidul, 2013).

But for commercial and domestic customer, cylinder gas is ensured to reach to the customer premises through the distributors; dealers/retailers network build up by the company according to their own strategy to attain their goal. Depending on the CP i.e. cost of bringing ship (importing gas) and adding up the operational cost, companies fix a rate of gas which is defined as ex factory rate. This price varies TK. 30-40 depending on the variation operational Excellency among the companies. All the distributors throughout the country purchase cylinder and gas from the company as per the ex factory rate. Distributors transport the Gas from the pant to their own territory by their own transport or transport given by the company. In case of personal transportation of the distributors, they get a transport subsidy from the company. Distributors' are prearranged to a target on new cylinder purchase and gas sales. They get incentives from the company on achieving of the target. Each year, about 5 lack new cylinder is entering in the market (Authors).

Distributor with the help of the sales executive of his territory ensures the supply of gas to the dealer point/ retailer point. Dealer gets another incentive from the company directly which enhance good relationship to the downstream customer of gas of the company. These dealers/ retailers sell gas to the end users. At the moment, companies are adapting satellite plant and RDC for more smooth delivery.

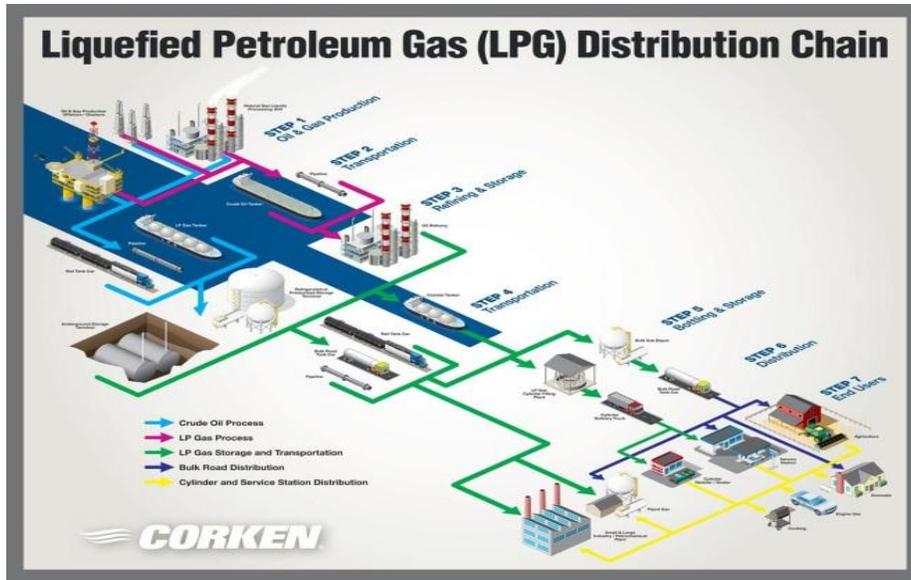


Figure-1: Supply Chain Process cycle (Corken, 2015)

Here the sales team is responsible for finding new customer, marketing team is responsible for developing promotional programs, operation department is ensuring the production, distribution department is monitoring the distribution, finance department is checking the accounts, safety department is ensuring the safety throughout the process, CRM is gathering customers feedback, trouble shooting department is solving the problem of the customer, Business development team is trying to get corporate client ,Vat officer’s adjust vat and tax issues, R&D team is finding new way for the technical development, HR department is recruiting new employees, monitoring their work through Performance Management System (PMS). Each and every department within the company is dependent to each other.

Supply chain process differs in terms of sales, production, distribution, customer relationship, inventory management, logistic support, financial evaluation techniques, uncertainty management, and network design due to the blessing of managed information flow; in some case due to e-automated process also.

5.0 Analysis of Data and Results:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	BSc	35	23.0	23.0	23.0
	MBA	39	25.7	25.7	48.7
	BBA	78	51.3	51.3	100.0
	Total	152	100.0	100.0	

Source: Authors

Here Table 1 represents that, most of the respondents are business graduates and they have completed their bachelor degree (BBA), they are 51.3%. Rests of the respondents are MBA (25.7%) and BSc (23%).

Table-2: Position in the organization					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Foreman	70	46.1	64.2	64.2
	Project Manager	39	25.7	35.8	100.0
	Total	109	71.7	100.0	
Missing	System	43	28.3		
Total		152	100.0		

Source: Authors

In the table 2, we have seen that some missing exists. It is indicating that some respondents did not provide their designation. Any way, among 152 people number of foreman is 70. Here also included IT experts, IT operations people, Distribution manager etc.

Table-3: Department					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	IT & Finance	109	71.7	71.7	71.7
	Marketing	43	28.3	28.3	100.0
	Total	152	100.0	100.0	

Source: Authors

Table 3 shows the department of respondents where they are working in that time. Here most of the respondent are in IT & Finance department & rest are in marketing department.

Table-4: Linked with Various Departments					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	About 3 Departments	78	51.3	51.3	51.3
	About 5 Departments	35	23.0	23.0	74.3
	All Departments	39	25.7	25.7	100.0
	Total	152	100.0	100.0	

Source: Authors

We have seen, table 4 shows that respondents are linked with different department and they need here information technology (IT).

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Phone Call	74	48.7	48.7	48.7
	E-Mail	43	28.3	28.3	77.0
	Via Your Boss	35	23.0	23.0	100.0
	Total	152	100.0	100.0	

Source: Authors

Here table 5 indicates that employees exchange their information via different forms. Maximum time they are using phone. They also used e-mail (28.3%).

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	74	48.7	48.7	48.7
	No	43	28.3	28.3	77.0
	3	35	23.0	23.0	100.0
	Total	152	100.0	100.0	

Source: Authors

In the table 6 we have seen organization doing their partnership with LPG suppliers most of the cases (48.7%). Some are also not focusing here.

Table-7: Scale Reliability of Observed Variables:

RELIABILITY ANALYSIS - SCALE (ALPHA)

Item-total Statistics				
Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted	
FTRUST	37.9868	428.9535	.9939	.9928
FSERQUAL	38.4474	408.8184	.9997	.9923
FQM	38.4474	408.8184	.9997	.9923
FAV	38.2434	441.5496	.9813	.9937
FHQ	38.4474	408.8184	.9997	.9923
FDST	37.7039	421.1767	.9804	.9926
FLCOM	38.9868	428.9535	.9939	.9928
FAORF	38.1645	401.3039	.9794	.9929
FRDD	38.1645	401.3039	.9794	.9929
FFLE	37.9605	433.9190	.8789	.9940
FCT	38.7303	416.7413	.9554	.9929
FSIM	38.4474	408.8184	.9997	.9923
FFIM	39.0132	425.0727	.8282	.9946
FIFORS	38.4474	408.8184	.9997	.9923
Reliability Coefficients				
N of Cases = 152.0		N of Items = 14		
Alpha = .9934				

Source: Authors

The scale items used to measure each observed variables are specifically derived from past studies. One of the most important measures of scale adequacy is scale reliability, which is the percent of variance in an observed variable. Although there are different methods to measure scale reliability, the more commonly used statistic is Cronbach's coefficient α . Cronbach's α measures the degree of interim correlation in each set of items and indicates the proportion of variance in the scale scores that is attributable to the true score. Cronbach's α levels below 0.7 are considered unacceptable (Sanders, 2005). Here all the observed variables have a value of Cronbach's α above 0.9. Thus, scales are sufficiently reliable for the data analysis.

Table-8: Descriptive Statistics of Observed Variables

Descriptive Statistics		
	N	Mean
Delivery on specified time	152	3.62
Flexibility	152	3.36
Trust	152	3.34
Reliable delivery date	152	3.16
Accuracy in order fulfillment	152	3.16
Added value	152	3.08
Integrated information system	152	2.88
Simplification of the process	152	2.88
Handling the quality	152	2.88
Quality of material	152	2.88
Service Quality	152	2.88
Fast order cycle time	152	2.59
Level of complains/ return	152	2.34
Free flow of information	152	2.31
Valid N (listwise)	152	

Source: Authors

Table 8 shows the findings. Where the mean value is high that is important. The mean value of delivery on specified time, flexibility, trust, reliable delivery date, accuracy in order fulfillment is higher here. So, in this situation LPG supply chain required Information Technology (IT) to attain the desired items.

6.0 Findings of this Study:

After analyzing the data, and doing interview we have got some findings in the LPG supply chain. These findings are as follows:

6.1 Role of IS in Supplier Relationship Management (SRM) of LPG: SRM is the required practice for the establishment of the business rule as well as understanding the necessity for interaction with supplier of product and services under a variety of critical situation or condition or agreement, related to the profitability of the company (Hope-Ross 2001).

In LPG Industry Sole, Multiple & Single, all these 3 types of suppliers are involved. Many parts & accessories, fittings are required to source from different suppliers both from inside & outside the country. Knowledge & skill is a major phenomenon is choosing correct material of correct specification. Mobile call, email, video chat are done with the supplier for information for repair & maintenance or new installation work. Proper co-ordination with production is ensured during maintenance work. Also the product or service specification, warranty, terms & conditions are informed among the employees to let them share their ideas also for better output. Correct supplier is chosen or existing suppliers are changed by collecting information concerning the quality of the product/ service & evaluating the Total Cost of Ownership of the product. Opportunity Management System (OMS) is a key activity

factor for a LPG company. Finding new technology in cylinder filling system, regulating & filtering system may lead the company to more smooth operation by developing the product quality simultaneously.

LPG is a gradually developing technology. The concerned personnel of the company should be always update regarding the new technology like, LPG cylinder Banking system, Vaporizer Technology, Autogas, Prepaid/Post paid metering system etc. Industrial cylinder tracking system, Road tanker's location tracking technology, e-banking, monitoring the plant with CCTV camera technology has already developed by the companies. Automation of B2B, C2B, and B2C process has reduced paper works & made the process easier. Relationship with supplier & suppliers' suppliers is kept to identify the origin of the problems or improvements. Sourcing ship from abroad by analyzing the inventory is a vital task in LPG business. LPG vessel inventory is checked by level gauge. LPG is a mixture of 70/30 Butane propane mixture. So, in case of selecting any supplier before importing LPG, it is a very important factor to know the propane butane ratio.

Business has become more competitive now days by opening many doors for sourcing any product. Many agents & third party are doing the sourcing. All the LPG machineries are imported from abroad. Some of them has appointed local agent who are working to promote their business. Some suppliers are directly dealing with the Companies. Some foremen, technicians are already skilled to do small repair & maintenance work in case of urgency.

Product wise catalogs are available in any Company website. They can track the number of people visiting them. Any type of information regarding any machine or service can be obtained easily. The verity of origin of product, specification, scope & price has enhanced the opportunity for comparison & chose the best one. Inventory analysis & re ordering is also plays a very important role in case of importing LPG from abroad. Most of the companies have level indicator attached with the storage tank. Others calculate it from sales volume. By EOQ analysis, the ship size is determined. If the ship size is larger than the storage, then ship unloading & cylinder filling, both the operation to be run simultaneously, this is very unsafe.

6.2 Role of IS in Internal Supply Chain Management (ISCM) of LPG: To attain the strategic goal, the flow of information is mutually distributed from the top management to a normal worker of the bottom level. The total team works to ensure the right product to the right customer at the right time, at right place, in the right condition, in the right quantity, in right cost. The internal and integrated supply chain management process ensures greater sharing of knowledge and information among the colleagues of different departments, ensures horizontal business process by replacing vertical departmental process, ensures customized production, process flexibility and better co-ordination (Davis, 1995).

For attaining the goal from the root level, HR has implemented Performance Management System inside the company where each and every employee is putting their own target in SMART and PURE factor. Thus the company target is mutually distributed among all the employees. HR identifies the interdepartmental dependency and co-operates the other departments to attain the goal. If any employee fails to achieve target, his duties are reshuffled and if needed special trainings are arranged for them.

Beside this information flow from top to bottom, huge amount of information is exchanged among different departments for achieving the target of the company.

6.3 Role of IS in CRM of LPG: Managing customer relationship is the crucial factor for smoothing the supply chain of LPG Business. LPG is still an expensive fuel for Bangladesh perspective. Only some private companies are running the business. Government is not giving any subsidy for the development of LPG business. For more heating value, less cooking time, portability, LPG is becoming popular by the housewives of rural zone. Gas is a daily commodity. So customer deserves gas delivery on time which is impossible until the supply chain is smooth throughout the channel.

CRM is responsible for gaining the customer perception (Performance, Features, Warranty, Service, and Price and Reputation) on a product. CRM usually deal with the distributor, dealer and customer. Call center is an important medium of CRM. Call center personnel categorizes the call and through the feedback or any complains in some case to the concerned department/ personnel.

When any advertisement is published in any newspaper for new dealer/ Distributor, a number of calls are received by the call center personnel. STAR (Smile and Greet, Talk and Listen, Answer and Anticipate, and Resolve) standard is followed in customer servicing issues. Customers ask pre queries, post service quality, product quality, availability pricing and discount (if any). When they get such call, they describe all the features and benefits of our product. Once a call is received, some actions are always taken. The main aim is to manage all aspects of the company's distributed operation- service parts inventory and logistics, contracts, warranty, preventive maintenance, service planning, support, scheduling & dispatch- as well as workforce & technicians. E-advertisement, e-marketing, e-promotion is new era in LPG business. Most of the LP Gas companies in Bangladesh have well structured website with detailed information on product range, catalog, quality & contact number of required personnel.

Customer care center can provide statistical data on use of the particular branded gas. They prepare customer list and update quarterly. They prioritize sales calls & generate analysis to support marketing strategies. They forecast the sales report, models the future strategically movement. Call center executive knocks to lost customer.

OmeraLPG has five No's of 24 hrs active safety number. Customer can take safety tips directly from the safety officer. It is the duty of the safety officer to inform about the safety at workplace, safe use, handling of LPG. Safety officer also advises and helps the dealer, distributor for getting license from explosive. Safety & fire fighting trainings are arranged after regular interval in different territory which informs the customer about the safe use of gas as well as a good marketing tool. Fire fighting training are also arranged for the Industrial & commercial customer to grow their consciousness.

6.4 Obstacles in Maintaining Information Flow in Supply Chain of LPG:

- A typical attitude that befalls when several departments or groups do not want to share information or knowledge with other individuals in the company. Silo mentality manifest "I win, you lose" (Wisner et al 2006). It is considered as one of the most significant obstacle to overcome the supply chain management (Cachon, 2006).
- Lack of information visibility along the supply chain members is a common problem. For example, the technical team of the company is doing erection job in some region without informing to the RSE who will ensure the gas supply hereafter (Chacon and Fisher 2000).
- Lack of knowledge, lack of technical adaptability, lack of interest to welcome new system also resist the growth of Company. In a survey of 122 executives practicing supply chain management, Wisner has shown that 43% identified lack of core supply chain management skill and knowledge was the greatest knowledge was the greatest obstacles within their own organization and 54% mentioned this view for their trading partners (Wisner et al 2006).
- The variability increase in moving up the supply chain from consumer to retailer store to distribution point to central warehouse (RDC) to factory is known as 'Bullwhip Effect'. Demand updating, order batching, price fluctuation, rationing and shortage can be the reason of Bullwhip effect inside the company. Firms that strive to share data, forecast, plans and other information can significantly reduce the Bullwhip effect (Lee et al, 1997).

7.0 Conclusion and Recommendation:

1. Integration of internal process with external supply chain network could be upgraded through communication, partnerships, alliances and cooperation. The pillars of supply chain integration are cooperation, collaboration, information sharing, trust, partnership, shared technology, and a fundamental shift away from managing individual function processes, to manage integrated chains of process.
2. Information visibility which ensures two-way information flow between the firm and suppliers, as well as the firm with its customers, nowadays firms have opportunities to utilize supply chain open innovations or technology to integrate with other members of the chain. Visibility or information sharing, reduces inventory costs, bullwhip effects and also ensures timely delivery.
3. Supply Chain measurements or metrics such as Inventory Turns, PDSA Cycle Time, DPMO and Fill Rate can be used to track Supply Chain performance. Supply Chain Measurements can cover many areas including Procurement, Production, Distribution, Warehousing, Inventory, Transportation, and Customer Service - any area of the supply chain. However, a good performance in one part of the Supply Chain is not sufficient. This focus should be kept on the key metrics in each area.
4. Trust although is more of a moral or cultural characteristic in a stepping stone prior to integration. Firms are likely to integrate with members they can trust, rather than the ones labeled as their competitors. Employees training and involvement before adopting new technology or innovation will not only empowers them but also eliminate the innovation-adaptation phobia.
5. The balanced scorecard translates the organization's strategy into four perspectives, (finances, customers, internal business processes and learning and growth) with a balance between the internal and external measures, objective measures and subjective measures, performance results and the drivers of future results. While using the balanced scorecard an organization wants to transform strategies into action. That is its real mission.
6. Introduction of uniform wholesale pricing, instead of discount prices for members in the chain, will further reduce the occurrence of bull-whip effects. Customer preferences, market size and customer demand information will reduce the chances of shortage supply, order batching and eventually the bull-whip manifestations.
7. Information sharing among supply chain members results Reduction of bullwhip effect, Detection of trouble quickly, Responding Faster, Building trust and confidence. Collaboration of planning, forecasting, replenishment, and design reduces bullwhip effect, Lowers Costs (material, logistics, operating, etc.), higher capacity utilization, and Improves customer service levels.
8. Coordinated workflow, production and operations, procurement increases Production efficiencies, Fast response, Improved service, Quicker to market. Adaptation of new business models and technologies enables Penetration of new markets, Creation of new products, improved efficiency, and Mass customization.
9. Collecting technical knowledge on installation & safety, observing the distribution system of our neighborhood countries, going through different journal papers can enhance the knowledge of the technical & supply chain managers. If they can take initiatives to adapt those in our country, the LPG business growth will increase.
10. By defining the standard acceptance criteria & dealing with standardized goods, purchase decisions can be automated. The evaluation of the technical team/ purchase officer is quite difficult. An incentive system can be developed by tracking their activity. The less is the repair & maintenance work, the more will be the efficiency of the operation department.
11. A SWOT (Strength, Weakness, Opportunities, and Threats) Analysis in every quarter can be done to gather business information regarding strengths and weaknesses in marketing, sales, production, technology, human resources, customer service, etc to set new strategies.

12. Company can progress by taking IT support in Enterprise Resource Planning (ERP), Electronic Data Interchange (EDI), Electronic POS (Point Of Sales) scanner, Electronic Payment (EP), Automatic replenishment of basic goods, Automatic replenishment for seasonal group, Advance Ship Notice (ASN). By implementing software in inventory management, project management, accounting, the business will be faster & less paper based.

13. Government should emphasize the use of NG in fertilizer & power sector to enhance the market of LPG & a scope to develop such technology in commercial & industrial sector. If government identifies the unlawful user of NG & disconnect the unlawful NG connections, then the power sector will be benefited. Government should increase the price of NG & give a subsidy on LPG to balance the cost for the user & to influence more people in using LPG.

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