

COVER STORY



TAXES

EFFECTS ON SUPPLY CHAIN

3D PRINTING

EMERGENCE OF 3D PRINTING WHICH POSES NEW CHALLENGES TO SUPPLY CHAIN



SUPPLY CHAIN

SUSTAINABILITY

SUSTAINABLE PRACTICES IN SUPPLY CHAIN

AGRICULTURAL SUPPLY CHAIN

A DETAILED ANALYSIS OF SUPPLY CHAIN CHALLENGES IN AGRI SECTOR



THEORY OF CONSTRAINTS IN SUPPLY CHAIN

APPLICATION OF THE THEORY OF CONSTRAINTS IN SUPPLY CHAIN



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Convener's Message

For years, human mind has been boggled by the constraints of operations in lieu of logistics and in the Indian forefront, NITIE has been the vanguard. Propagating the tradition passionately and descriptively, NITIE collaborates with the thoughts of the leaders in the industry, faculty across the globe and with the students from various esteemed institutes to bring out the best of the invaluable knowledge on the back bone of the industry, The Supply Chain Management.

Chain-to-Excellence (C2X) has been the major stakeholder in conducting some of the most challenging supply chain competitions, organizing enlightening sessions from industry leaders and through its novel initiative – The OPUS. OPUS aims to bring forth the most challenging business situations and practices in the field of Supply Chain Management, and initiate intriguing thoughts in the students to make excellence a habit for all its readers.

OPUS has laid the foundation to build up and strengthen credentials of a fabulous source of knowledge, and timely herald of news and happenings in the world of supply chain management. This version OPUS intends not to be just a magazine but to be a reference and a case guide to students in the arena of supply chain management. It is here to act as a bridge for industry problems and the very coveted ideas sought by the evolving Industry in the rat race to lead.

I believe that Team C2X will continue its chain of unfolding the most innovative ideas to enlighten one and all in the fields of SCM and keep glorifying the institute in this unending quest for excellence. I congratulate the efforts behind this wonderful creation and wish all the readers that their chains to excellence start right here!

From the Editor's Desk

Today the Indian economy is facing severe challenges like inflation, rising cost of raw materials and depreciation of currency which together add to the final cost of finished products and uncertainties in the market. The Indian customers are still not prepared to the extent that the entire burden of increased prices can be passed on to them. This is posing a serious threat to company's bottom line. So, here supply chain becomes the source of competitive advantage.

In order to bring efficiency in supply chain and control escalating costs, the spotlight is back on the taxation policy in India. It is time that we analyse present tax structures and evaluate expected changes in supply chain that can result due to the introduction of GST.

With the increasing focus on environment, underlining the importance of green practices, a lot of attention is drawn on the sustainability of supply chain. In this edition, an attempt is made to look into various roadblocks towards its implementation and the possible recommendations for the companies to go about it. Also, on the technical front, supply chain is evolving and moving towards RFID and other quick information exchange mechanisms. An understanding and analysis of the upcoming change is presented to give an insight to the readers about how it can impact the value chain.

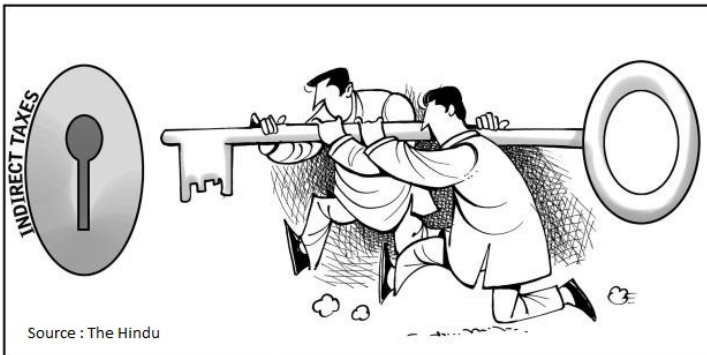
Companies know that they've got to keep a steady stream of new products and/or services flowing—to keep up with the competition. As circumstances, needs and trends change, no one wants to get left behind. The key to succeed is 'Innovation', which is not a one step process. New product development consists of many stages and processes that need to be followed for launching it in the market. A brief description about the flow of activities has been studied and explicated here.

In our endeavour to be the harbinger of latest trends in Supply Chain domain, we C2X (Supply Chain Interest Group of NITIE) present to you the Volume 2, Issue 1 of OPUS, the supply chain magazine.

We express our sincere gratitude to Professor Bhasin for his guidance in bringing out this magazine.

Team Chain 2 Excellence

OPUS



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TAXES & MONEY

Mr. Money Rantam could not believe his eyes. This middle class truck driver just won a Rs.75 crore lottery. Finally, he can fulfill his lifelong dream, to have his own business, his own company. He decided to call it 'A little more Money' that would sell X, Y and Z. He was very thrilled to have his own company but at the same time, he was very scared of the taxes he had to pay. He knew about direct taxes but it was the indirect taxes that he was concerned about. 'What all taxes are there in the supply chain involved?', 'At what rate will the government charge me?', 'How often do I need to pay them?' and 'Can I somehow reduce the amount of tax?'... These were some of the questions that intrigued him.

The one person he could trust and ask for help was his daughter, Dhan Lakshmi who was pursuing her post graduate course at NITIE. The first thing that Lakshmi taught him was about the various types of taxes involved, viz-a-viz

- a) Customs Duty
- b) Excise Duty
- c) VAT
- d) Service Tax
- e) CST
- f) Octroi

"Wow, such words also exist in the universe!" was Money Ratnam's reply to this plethora of jargons. He wanted to know more about these taxes, he was anxious. The first thing he knew was that he had to procure some of the raw materials from overseas and some from within the country. So he decided to go to the docks of Mumbai, to know more about the taxes incurred on importing of these raw materials from other countries.

CUSTOMS

His friend at the docks introduced him to the assistant Port Director, Paanilal. Within a few minutes Paanilal understood that Money Ratnam could be a potential customer for his port and started explaining him about the Customs Duty involved while importing goods through sea. Paanilal explained that India has not

been famous for managing indirect taxes very well. For instance, the expenditure on customs was not recorded separately. Rather it was aggregated with other costs like freight forwarding costs, broker fees, etc. Companies were not aware of the customs they paid annually and moreover, it's significance. But in recent times, the situation has changed. Now tax management information is properly collected, monitored and worked upon. Hence, companies can easily recognize situations where they need to improve. The government is also trying to boost up exports through the development of Export Oriented Units (EOUs) and Special Economic Zones (SEZs). But the challenge lies in the reconciliation of exports and domestic demands and the creation of an integrated supply chain system that not

"What all taxes are there in the supply chain involved?', 'At what rate will the government charge me?', 'How often do I need to pay them?' and 'Can I somehow reduce the amount of tax?'"

only caters to redundancies but also to overlaps and shortages.

Money Ratnam asked him, "But what is the importance of paying customs, keeping its proper records; and what other problems can I face at a

port?" Paanilal explained that "being serious about your custom duties will help you reduce your production costs and speed up the delivery time. Contrary to that, if you try to move products cross-border without the proper customs documents and export licenses, it may result into costly delays and your goods might also get seized. Organizations also face challenges due to the lack of space and modernized handling facilities at different seaports and airports. This results in higher turn-around time and consequently increased costs. It also adds up to the peak time waiting periods that are very high as compared to various modern ports in other parts of the globe." Money Ratnam understood that customs was something he cannot ignore. He wanted to know more and so Paanilal continued "The extent of customs duties that you pay basically depends on the customs value, tariff code and the place from where the goods are being imported, i.e. the origin. To determine the import duties on the various types of goods, special tariff (HS) codes have been agreed upon at an international level. Origin of the goods also plays a key role in determining the customs duty on the goods. Hence, various countries have agreed upon bilateral and multilateral FTA'S.

Here was a word that brought Money Ratnam's attention back on the discussion. He couldn't resist to ask "What are these 'FREE' Trade Agreements?" Even though Paanilal was getting restless because a shipment was waiting for his approval to leave, he couldn't afford to upset a customer. So he explained that "bilateral or multilateral agreements like FTAs are pacts between two or more countries that allow for reduced or even zero-rate tariff duties for goods that are coming in from the preferred trade partner. For instance, India has bilateral agreements signed with SAFTA, ASEAN, Sri Lanka, Singapore, Japan and South Korea.

EXCISE DUTY

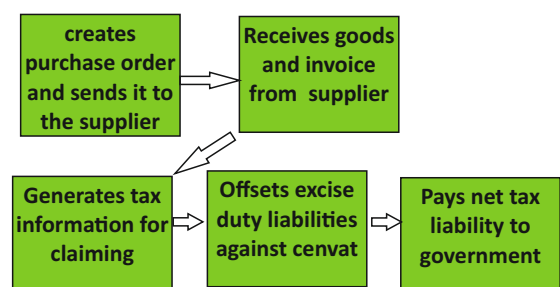
Now, Money Ratnam knew that after procuring the raw materials and taking care of the customs, the next step is to manufacture the product. And when you make a product, you pay excise. So this was his next challenge, to know about the excise duties that a company pays. Over the years, Money had worked for various manufactures and there was one person who would surely help Money solve the puzzle of Excise Duties, Ms. Manu Factorywala. But there was only one problem, when she began to speak, she couldn't be stopped. So knowing that his hearing abilities would be tested by Ms. Factorywala, Money Ratnam reached her office, explained his situation and as expected, Ms. Manu began...

"Excise duties are nothing but taxes levied by the central government of India on the goods that are manufactured in India. We, as buyers, collect this duty from the purchasers when we sell them the product. It can be based either on the price of the goods that are being exchanged or sometimes it is fixed also. And you know our government Money, just to bring something new in the system, they've now started calling the Excise Duty with a new name – CENVAT, the Central Value Added Tax. But what you need to understand here is that Excise duties are a critical part of the tax base for VAT. So any change in the value of excise would affect the VAT applicable."

Money found a chance to speak and immediately asked a doubt he had in his mind, "So does every manufacturer pays Excise?" Ms. Factorywala had his answer and a really long one, "See, if you are manufacturing a product, you have to pay to the

government. It doesn't matter if you're doing it personally or outsourcing it to other parties. However, there are a few exceptions. Manufacturers who export their product need not pay excise but they are liable to submit ARE-1 bonds or ARE-3 certificates to the authorities. These are equivalent to the excise amount or quantity. Also, since dealers are only responsible for the transfer of goods from one place to another, they are not liable to pay excise duties. As a manufacturer, you need to pay excise at two stages: when you purchase raw materials and when you sell the finished goods. Purchasing is a part of the P2P cycle and selling is the part of O2C cycle"

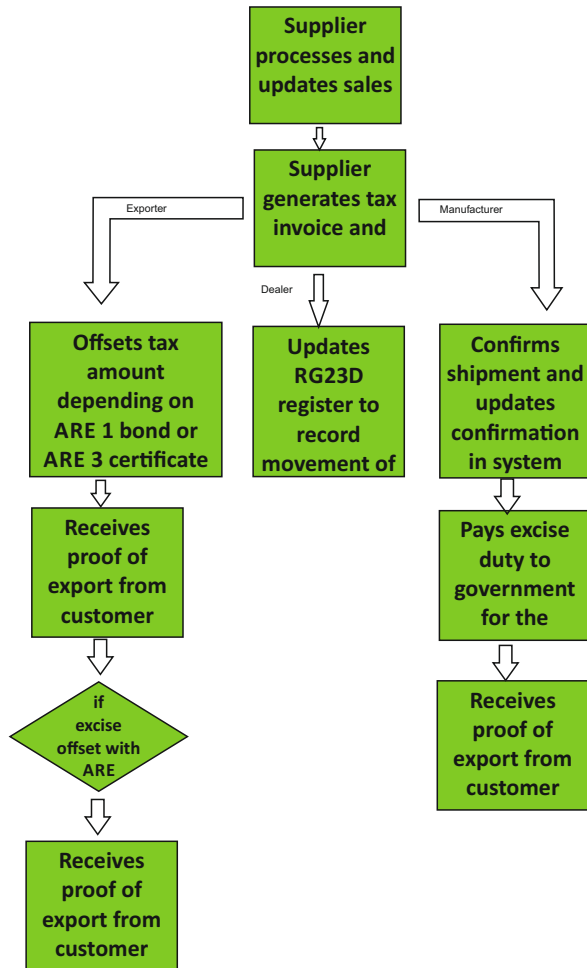
From the expressions on Money Ratnam's face, Ms. Factorywala understood that he was getting confused. So she picked a piece of paper and tried to explain these P2P and O2C cycles with diagrams. And then she continued her monologue, "Globally, there exist three principal products that attract excise duty- alcohol, hydrocarbon oils and tobacco products. But in our country, we pay excise on almost all manufactured products. Either we pay excise through GAR-7 or in some cases, like tobacco or alcohol, excise duty is applied through revenue stamps that are affixed to the products being sold. Now, one interesting thing about excise duty is that, since the duties are due at the moment of consumption, companies should ensure that they pay their excise duty only once, in the country of actual consumption, by the help of excise suspension regimes like a tax warehouse. But some companies don't pay attention to this detail and end up paying extra duties.



Excise process flow of P2P cycle

Other issues related to excise duties might arise if you do not abide by the legal requirements and this may lead to penalties, delays

You might also have to pay fines up to 1000% of the original tax or there might even be a criminal prosecution. However, you need not worry much; the GOI has several suspension and exemption regimes that alleviate the burden of excise duties. In 2010-11, our government signed off Rs.192227 crore in excise duties. So don't worry about the excise duties and you call always call me for any assistance you need."



Excise process flow of O2C cycle

OCTROI

After the customs and the excise part of the taxes, now the next item on Money Ratnam's check list was Octroi. Being a truck driver himself, Mr. Money knew a little

about the octroi tax, after all he was paying it whenever he entered a new municipal region or city. But now that he would have trucks running under his supervision, he wanted to know more about it. So he called up his brother who was there in the Pune Municipal Corporation, Moti Ratnam. Mr. Money knew that Octroi was only paid in the state of Maharashtra but when Moti told him that apart from Ethiopia, Maharashtra is the only place in the world where octroi exists, he was astonished. Moti also told him that Octroi, a tax applicable on the entry of goods into a city or town, forces manufacturers to locate their warehouses outside the city and move their goods into the city only when actual sales of the product takes place, simply to avoid taxes on moving inventory inside the city limits. Thus, octroi often results in the addition of a tier in supply chain and hence, higher costs. But when Moti said that the CM of Maharashtra, Prithviraj Chavan has announced that octroi will be cancelled and LBT, i.e. Local Body Tax, with effect from 1 October 2013, Money got more interested in knowing about LBT. Since, LBT was not in effect till then, Moti also knew a little about it. But he tried to explain whatever he knew to Money.

The LBT system will work differently from Octroi. Traders will have to compile a list of all goods procured within the month and feed the matter into the software given by the municipality to check their LBT liability. They will have to make payment once every 40 days using online portals, cheque, demand draft or cash via a designated bank or counters of the civic bodies. As per the rules, every trader whose annual turnover of purchase and sales of the goods included in the taxable schedule is not less than Rs 1,00,000 is supposed to be registered with the local civic body i.e. municipality and is liable to pay LBT.

CST/VAT

Money was starting to feel a little confident with taxes. But still, he was very confused about CST and VAT. Incidentally, his friend, Mr. Phunni Bhargav happened to be an indirect tax consultant and took harge to explain Mr. Ratnam the critical role that

DID YOU KNOW

The World Bank recently ranked Singapore as the No. 1 Logistics Hub amongst 155 countries globally in the 2012 Logistics Performance Index. Singapore's strategic location in the heart of Southeast Asia and at the nexus of major shipping lanes has made it an important logistics hub and conduit for world trade

these taxes play in transportation and warehousing. Their implementation makes the supply chain design and optimization all the more challenging. While VAT is applicable only when the buyer and seller are in the same state, CST comes into the picture when the goods are sold from one state to another. Modeling of CST requires knowledge of the source and destination of the goods and whether the lane is inter/intra-state. Interestingly, CST is not levied if the goods are moved for the purpose of storage. Hence, manufacturers move their goods to a warehouse in each state as internal stock transfer and the sale that follows is thereafter shown as an intra-state transaction. But this increases the cost of holding and maintaining a large number of 'small' warehouses in several states. Adding up to the overall supply chain cost drastically.

Mr Phunni explained to Money that “the rates of VAT and CST are dependent on the state and the product you would be selling or transporting. You need to register for VAT in case your turnover is more than 5 lacks or depending on some states, 10 lacks. Once you are registered, you would be allotted an 11 digit TIN, i.e. Taxpayer's Identification Number. But as far as CST is concerned, you'll have to register once you start transferring goods from one state to another, no matter what your revenue is. Once you are entitled to pay VAT, you need to pay that before the 15th of the succeeding month, i.e. the VAT for the month of June is to be paid by 15th July. However in the case of CST, there is relaxation of 5 days, i.e. you need to pay it by 20th of the succeeding month.”

Money was getting a little concerned of the amount he had to pay in taxes alone, leave out procurement, IT,

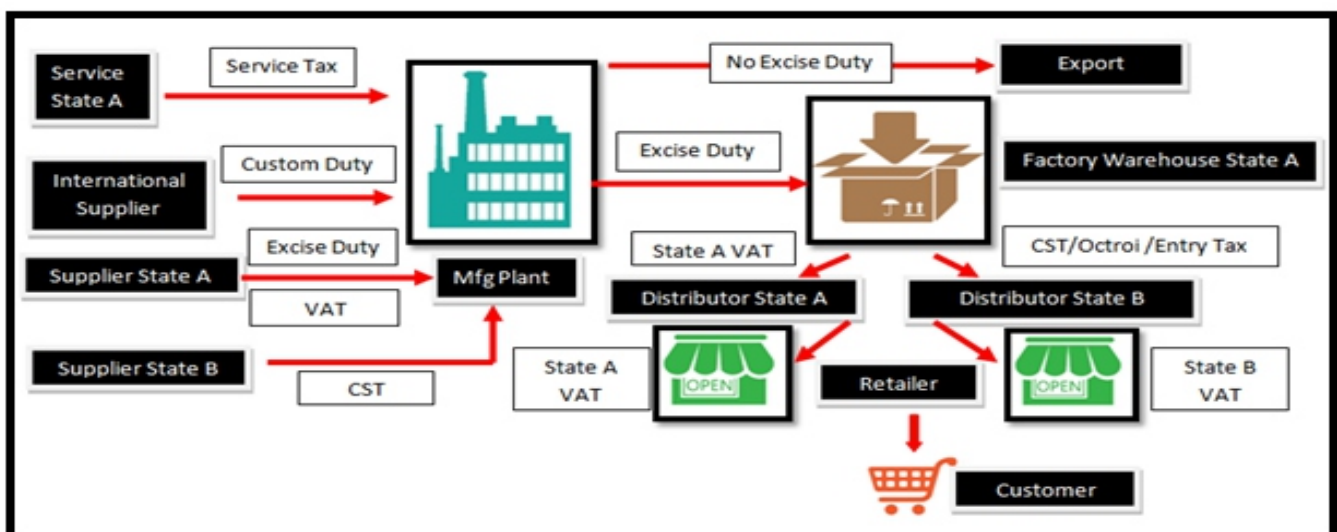
marketing, etc. So he asked Phunni if there was a way to reduce his burden of CST and VAT. Phunni explained it to him that there are three forms that can help him in his mission to save 'money'.

Form I - An Inter-state sale, made to a Special Economic Zone (SEZ) registered dealer for use by him in authorized operations in the unit in SEZ, is exempt from payment of the Central Sales Tax if the selling dealer furnishes Form I to its assessing authority after obtaining it from the SEZ dealer.

Form C - Irrespective of rate of tax applicable to sale of certain goods within a State, where the rate of tax on sale of these goods within the State is higher than 2%, the purchasing dealer, making inter-state purchase, can, with the help of Form C, purchase these goods after paying tax to the seller only @2%. In absence of Form-C, purchasing dealer would have been liable for payment of tax at the same rate which is applicable to sale of such goods within the State of selling dealer.

FORM J - This form provides for granting exemption from tax on inter-state sales of any goods made to any official, personnel, consular or diplomatic agent of any foreign diplomatic mission or consulate in India; or the United Nations or any other similar international body.

Now Mr. Ratnam was fully aware when he had to pay taxes, the nature of taxes, and how he can avail the benefits of tax exemptions. All the questions which arrived in the mind of a budding entrepreneur were answered; thanks to his old and new friends, Mr. Paanilal, Ms. Factorywala, Mr. Phunni and his brother, Mr. Moti. He could now manage his taxes efficiently and deal with cash flow problems.



3 YEARS LATER (GST)

Mr. Money was making more money than he had imagined. His daughter joined his company and was heading the supply chain. But changes are inevitable. And with 2016 came GST. It was implemented finally and there came a big change in the Indian business environment. Money Ratnam hired a consultant to explain him about the difference between the pre GST and post GST taxation and how it will affect costs involved.

The consultant told that with the introduction of GST, the cascading taxation problem, where the tax paid earlier in the value chain is taxed again, will be solved. CST, VAT, surcharges, service tax etc will be abolished. GST would be levied simultaneously by the centre as CGST and by the state as SGST. Credit will be given for any tax paid earlier including the credit for service tax by manufacturers. Under GST, inter-state sales transactions between two dealers would be cost equivalent compared with stock transfers / branch transfers. In short India would become one single common market no longer divided by state borders.

Elimination of the existing penalties on interstate sales transactions will facilitate consolidation of vendors and suppliers. This will eliminate the need to have state wise warehouses to avoid CST leading to elimination of redundant level of warehousing in the supply chain. This will result in improved efficiencies, better control and reduction in inventory due to lesser numbers of stocking points and cases of stock outs.



formalities at check posts en route.

According to a study, on an average, a vehicle on Indian roads loses between 24 and 48 hours complying with paperwork and



DID YOU KNOW

Dabbawalas is an old industry for 125 years, which is recognized by Forbes at the six sigma level in 2002. There are about 4500 to 5000 dabbawalas who deliver more than 175000 lunch boxes per day across Mumbai. They deliver dabbas at the distance of 75 km. Their customers consist of 11% students, 15% businessmen, 36 % Government, 38 % employees of private sectors. The most inspiring thing is that there is only one mistake in deliveries of every 6 million. That's an efficient supply-chain management.

GST will enable reducing time involved in paperwork. It will also reduce IT costs of having ERPs deployed at many small warehouses. The entire process of designing supply chain will rely on the economic logistics. Most of the time companies will use hub and spoke model for the distribution of its products. But there are certain challenges that need to be tackled. Since warehouse has to deal with large no of dealers, route planning will be an issue. The cost of secondary freight will increase. Truck load utilization in secondary distribution will decrease.

The consultant assumed excise duty to be 12.36%, VAT as 12%, CST as 2% and GST as 16% and showed him the calculation depicting changes in tax structure.

		Pre GST	Net Tax	Post GST	Net Tax
Vendor	Cost of mfg	100.00		100.00	
	Excise	12.36	12.36		
	VAT	13.48	13.48		
	GST			16.00	16
	Final Price	125.84		116.00	
	Total Tax Paid		25.84		16
Manufacturing Unit (stock transfer only)	Value Addition	30.00		30.00	
	Basic Price	155.84		146.00	
	Excise				
	VAT				
	GST			23.36	7.36
	Final Price	155.84		153.36	
Total Tax Paid				23.36	
Warehouse in state A to Dealer in state B	Value Addition	30.00		30.00	
	Basic Price	185.84		183.36	
	Excise	22.97	10.61		
	VAT	25.06	25.06		
	GST			29.34	21.98
	CST	4.68	4.68		
Final Price	226.19		205.34		
Total Tax Paid		66.19		45.34	
Warehouse in state A to Dealer in state A	Value Addition	30.00		30.00	
	Basic Price	185.84		183.36	
	Excise	22.97	10.61		
	VAT	25.06	25.06		
	GST			29.34	21.98
	CST				
Final Price	221.68		212.70		
Total Tax Paid		61.51		45.34	

Tax Structure

INTERNET OF THINGS IN SUPPLY CHAIN



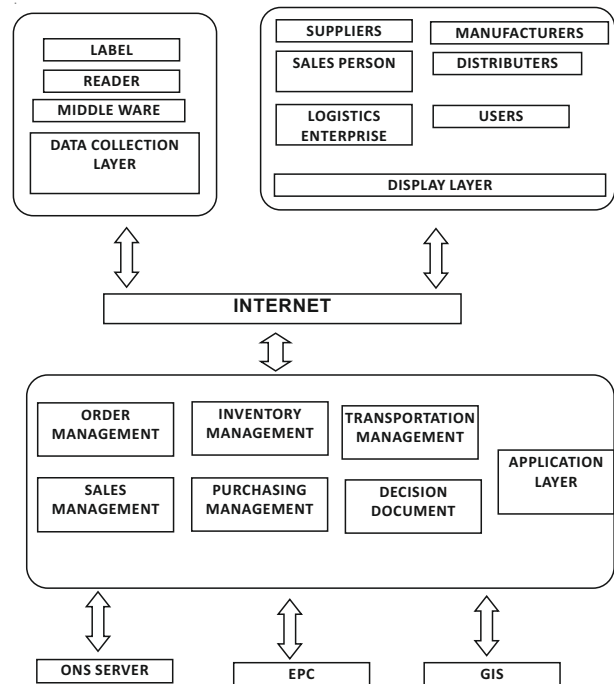
ANUBHA TANEJA PRABHASH SHARMA
 SP Jain Institute of Management and Research,
 Mumbai

Supply Chain Management encompasses a series of activities which involves procuring raw materials from suppliers, transporting them to manufacturing units, transforming the raw materials into finished goods and distributing them to the customer. Since the entire process comprises of complex network of suppliers, factories, distribution cells and customers, the system has to be efficient, effective and robust. This was the traditional SCM Model. It had some limitations, such as, in most of the cases it had fixed designs that could not be changed according to the real time environment. Also the model used to be cost oriented and not revenue oriented. To save upon the recurring cost, a generalized Supply Chain System was implemented.

For this process to work in the desired manner flow of material and information becomes pivotal. But the flow of information is often outpaced by the flow of materials in the SCM. Information technology is used passively to study the processes but no real time information is available which could help analyse them and the inefficiencies associated with it deeply. This is where Internet of Things can be extremely useful. It is how materials can interact using internet/web. In SCM this can be used to obtain real time information regarding the materials right after procurement to the distribution of materials. This technology not only helps to track the materials but also through real time analysis helps to remove inefficiencies in the system real time eventually assisting us in taking and implementing decisions.

The following diagram depicts the business layers at

various levels of back end, distribution to retailers and



Visibility structure of Internet of Things

eventually to users, and usage of internet to get real time information on the input provided. This layer gets the data, processes it, and transmits the output to the application layer.

STUDY SO FAR

IOT is a system where the physical objects are connected to sensors making the objects omnipresent. The sensors use the RFID technology to communicate among the materials.

SCM being a network of suppliers with factories and distributors, eventually connecting to the consumer, IOT would contribute in making the process simpler and more efficient.

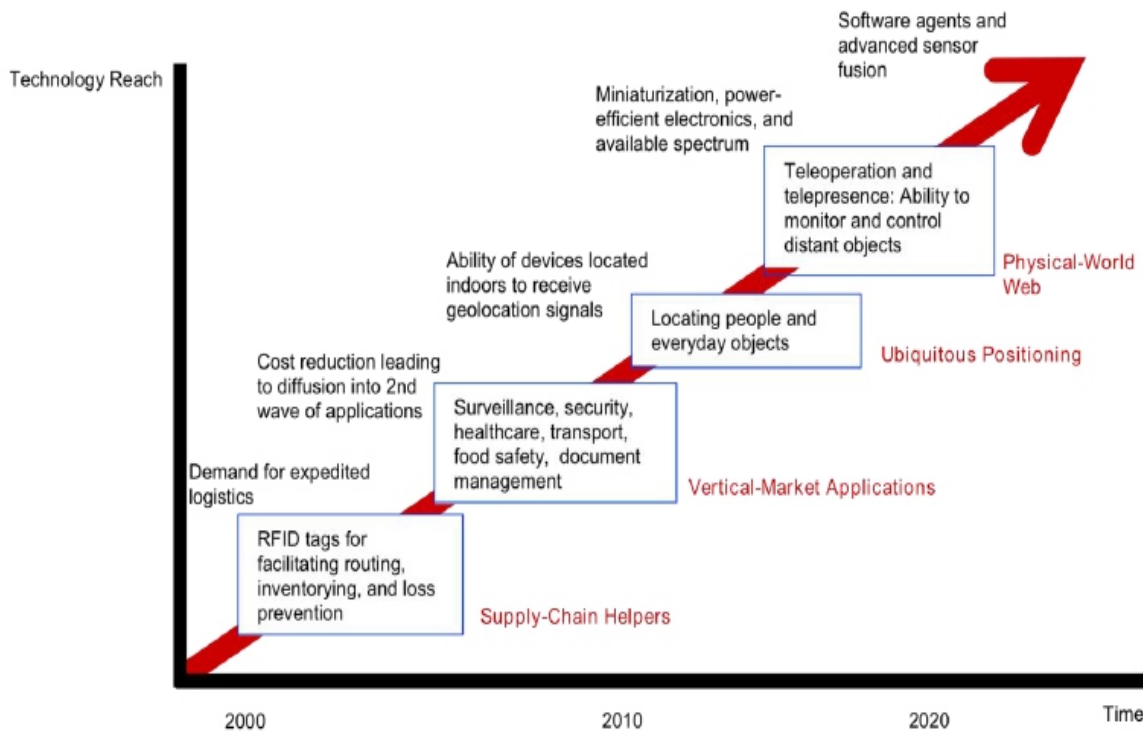
There are 2 types of Applications:

1. Planning applications
2. Execution applications

Planning applications include different algorithms to make and fill an order. Whereas Execution applications include all the intermediate steps in delivering of the order like, flow of finances, tracking the current location of dispatched material and cost computation of reaching the warehouse.

The technology used in making Internet of Things practical is Electronic Product Code (EPC), Radio Frequency Identification (RFID) and EPCglobal Networks.

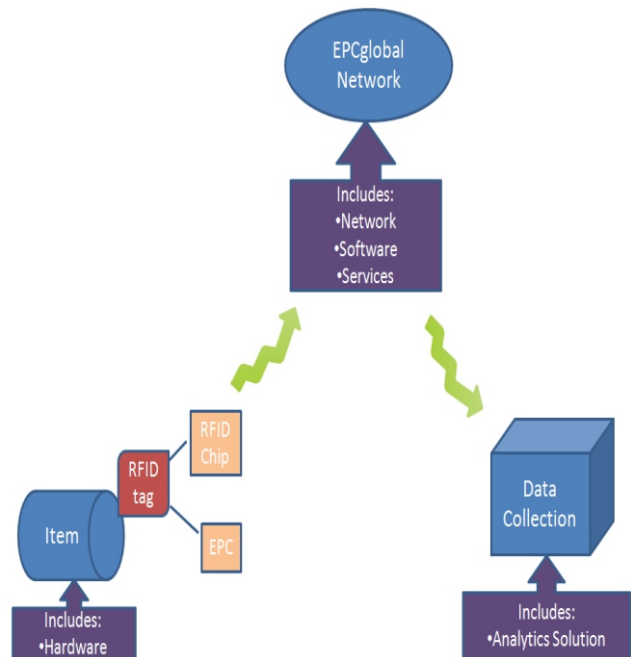
Technology Roadmap: Internet of Things



Source: SRI Consulting Business Intelligence

EPC is a unique number on every item, which becomes the identity of the item. It is like a barcode on every item, only difference being that it is associated with dynamic data of the item. Unlike the barcode, which has only the product category, EPC holds the identity of the item through the unique features of the item, like date of production or independent serial number. This makes the item equipped enough to be tracked throughout its journey, from the manufacturer to the buyer.

RFID is a wireless technology, used to store and process information, modulate radio frequency signal and transmit and receive signals. EPC, along with the RFID chip is stored on an RFID tag. The RFID chip transmits the information of EPC through EPCglobal Network. The EPCglobal Network comprises of the devices and services used for automatic identification and immediate transfer of information on the items



(EPC). These devices include the EPC Readers and EPC tags, EPC Middleware and EPC Services, for smooth and undisruptive transmission of information.

IOT in SCM has currently also moved to the retail shopping. For example “The TeamLab Hanger” illustrates how IOT offers on the spot information to the customers. As soon as a customer picks up a hanger, a screen displays the clothes giving a visual experience to the user. This helps in making the customer make the purchase decision.

The RFID chip inside the RFID tag on the clothes allows the automatic identification of the object. This information passed through the network is read by the wireless RFID reader, passing on the data, thus displaying the item.

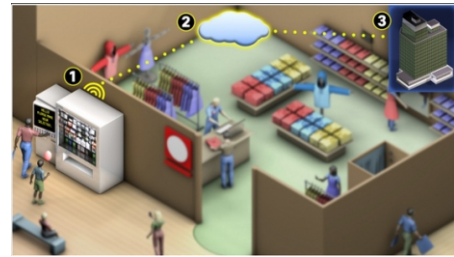
CISCO defines the Internet of Everything as a connection of people, data, information, devices and things which will be more valuable than processing and transferring of signals from one item to another. The relevance of IOE in today's market can be depicted by the following experiences:



1. High profitability by involving the customer- Internet of Everything will help not only the business in a sector, but will even improve the customer experience, hospitality, and service. This will in turn give more profits to the business and a convenient experience to the customers.



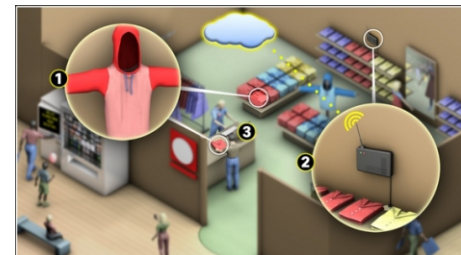
2. Maximising value of retail space- the space in a mall can be utilized by putting up devices with IOT given real time information of type of items, sale,



available stock, price and other related information in a store. This will reduce the requirement of excess or untrained staff in the mall

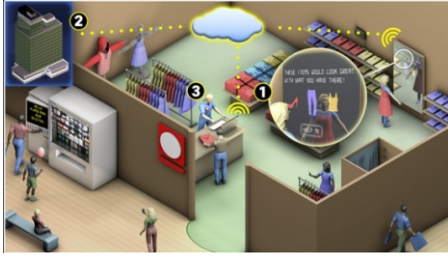


3. Location based services- this service can help the retailer detect if their valued customer is in the vicinity; they can drop a message to the customer's mobile phone. This message can be about latest collection, new stock, or discounts within a limited duration.

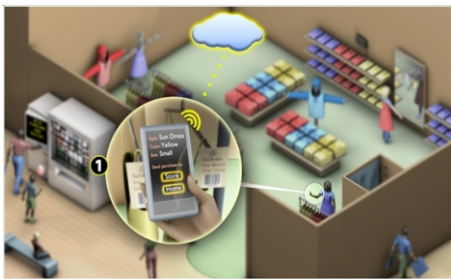


4. Optimize inventory- RFID sensors on the items available at an outlet can help the shopkeeper in sale of a particular item. The retailer can then increase the inventory in his/her store accordingly, based on weather, popularity and so on.

5. Assisting customers- Sometimes due to time constraints or various other reasons, customers are not able to try on the clothes of their choice before buying them. In that case, a customer can just put a particular piece of dress in front of him/her and check the fitting, colour and other colours available in different sizes of that particular piece of cloth. Also, to know real time information, the customer can ask for further help through the interactive machine present in the store. This provides fast access of information to the customer, increasing sales and thus increasing profitability.



6. Connecting customers - This can help in connecting customer to different sales outlets of the same brand. The customer can look into his phone to know which all stores have the same clothes, in the required size and colour, in a particular locality.



These features help in reducing confusion among different stores, create a level of consistency among them and provide flawless information to the customers having different needs and requirements. Also it would reduce significant amount of staff in the stores creating a clearer and greater level of understanding among the customers. This creates not only a network among people and material, but also creates value for this network. Thus in current scenario, “Internet of Everything” is a typical term given by CISCO.

CHALLENGES

Current Research

The research has to be done more extensively as the technology with the required efficiency and security is currently insufficient.

Transparency in Logistics

Logistics has always been an area wherein all the departments have to have complete transparency for IOT in SCM to be functional. This might necessitate some changes and amendments to the Standard Operation Procedures.

Cost

With unexplored areas still persisting in IOT, there is an inevitable need for in depth research of IOT in SCM. Operations, research and procurement of materials for the implementation of IOT and maintenance will make it highly expensive to execute in everyday life.

Efficiency

All the machines and sensors in IOT are interconnected to each other therefore even a smallest problem in any of the machines or services in the system can lead to the failure of the entire IOT system. This can only be prevented by implementing an efficient system and reliable materials.

Benefits

Improved Inventory Management

Inventories are kept as a buffer to meet the demand. Businesses usually hold stock to meet the demands of the customer because supplier might not be able to produce that much and meet the demand immediately; it might take supplier many days to produce and deliver so as to meet the demand. Moreover holding stock for businesses is very expensive as it requires infrastructure to hold the inventories. This is where IOT helps, using IOT real time information is available to the supplier about the stock available and decisions can be taken regarding production in advance which reduces the number of days it takes to supply goods from supplier to businesses and hence helps the businesses to reduce the stock stored.

DID YOU KNOW

The old concept of “it's not easy being green” is being challenged by new technologies. Concern for the environment and shortages of raw materials are causing companies to seek manufacturing methods that require less energy expenditure and that reuse materials instead of disposing of them. Have you noticed how personal care products – which were once packaged in individual boxes – now have no boxes? That's part of making the product green. Why create packaging that's just going to be thrown in the trash? Instead of costing more to “go green,” many new technologies are saving companies money by creating green supply chains.

Process Optimisation

IOT has a great impact in optimising the processes and hence increasing production. IOT uses the combination of sensors and actuators to enhance productivity. During the process sensors collect data and this data is sent to the computers and analyzed. This is used in turn to send signals to actuators that alter the process based on the feedback given by analyzed data. For example in paper and pulp industry where the temperature of kilns is important for the productivity, this technology helps to reduce the variance in temperature and increase the productivity.

Resource Optimisation

IOT can help in changing the usage pattern of scarce resources like water, power etc. by providing the real time automated feedback for the same. For example some energy companies are providing real time information to their customer like power usage and the real time pricing for the same. Based on this information customer can make the decision to shut down a particular device and this helps immensely in saving energy.

Increased Logistic Transparency

IOT helps to make information pervasive across the entire supply chain rather than in the hands of only logistic operator. For example while transportation of goods if the conditions are not favourable for the goods driver is informed by the automated system and he can take steps to prevent the damage of good. This also increases accountability on the part of everyone involved in SCM. It also helps to reduce the number of damaged goods and hence losses to the business and enhances customer satisfaction.

CONCLUSION

The Internet of things will help in evolving new business models going in future. Following can be the potential businesses opportunities:

Data Storage and Analysis

With the increased use of IOT vast amount of data will be available and that data can be analysed to make important business decisions like pricing decisions. This data and analysis can expand the business of data analytics manifold.

Data Security

With so much of data available, it will open new opportunities for data security vendors to protect the confidential data from potential cyber attack.

Carbon Footprint

IOT could be used to capture the carbon footprint per product and vast databases will be used for the same. Moreover when the environmental issues assume pivotal importance businesses will thrive using this data to cut down significantly on carbon footprint of different products, leading to "Zero Waste Economy".

IOT has started shaping the way things interact with each other and open plethora of opportunities for businesses. It has immense potential in improving SCM as discussed above. Companies in future will expand using IOT and new businesses will emerge based on IOT.



DID YOU KNOW

Alexander the Great: Great Logistical Innovation

Roughly 2,300 years after the life of Alexander the Great, this aggressive military leader is still revered as one of history's greatest tactical and logistical figures. Shortly after assuming the Macedonian throne, young Alexander embarked on a conquest that would last the remainder of his life.

At age 21, Alexander led a group of 40,000 soldiers and 6,000 horsemen to Asia Minor with a meager supply of food. He carefully planned the timing of the sea journey and his 30 days of rations to last 10 days beyond the harvest date in the country he was attacking.

On land, Alexander's army could only carry a 10-day supply of food, yet they covered 19 miles per day. This fast pace would lead him across Persia and India with a group of men that would eventually exceed 90,000.

He is famous for saying, "My logisticians are a humorless lot. They know they are the first ones I will slay if my campaign fails." Alexander the Great was a pioneer in logistical planning and efficiency.



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The duration of the programme is five days (42 hours).

2. Advanced Language skills for mid-level managers

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- Giving presentations by developing unconscious competency

The duration of the programme is five days (42 hours).

3. Language, Analysis and Philosophy for Top level management

How does language affect business? Usually, this question is reduced to second language skills, for example, learning Japanese, or preparing company communications in the language of the intended audience. What we want to consider is how does language, as a business communication tool, and not as a second language skill, affects the bottom-line in business. What is the causal relationship between language and the bottom-line? The answer is not as simple as it sounds! Language and philosophy are mutually complimentary and ethics is the framework that facilitates the plan of action. One of the banks in the US came up with a print advertisement expressing its competitive advantage: "We Speak Human. Wanted: Philosophers in pinstripes!"

This programme is unique for the following reasons:

- Gives solution based interactive inputs which facilitates a philosophical approach to problem solving in rational framework
- Developing multiple frameworks and contextual thought process
- Creating synergy among beliefs, values, ethics and communication

The duration of programme is 2 days (16 hours only).

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DID YOU KNOW

Supply Chain Visibility

Deciding where to invest money in supply chain improvement projects is a bit of a gamble. In most cases, money is spent based upon the squeaky-wheel premise: greasing the palm of that squeaky wheel with large amounts of cash. But that's a little like rearranging the furniture in a dark room without turning on the lights. How do you know that the wheel squeaking the loudest is the one that really needs the grease? Maybe it's just a noisy wheel that likes attention. Before throwing grease at the wheels in your supply chain, it's a good idea to turn on the lights and see how all the other wheels are turning. Once you can see all the wheels, you might find that another one needs the grease even more.

Supply Chain humour

- If you're a supplier and you think nobody cares if you're alive, try missing a couple of delivery dates.
- What's the difference between big foot and an accurate forecast? Big foot has been sighted.
- The easiest way to find that missing inventory is to place a new PO.
- A planner says the Demand Manager, "what do you like most, my new forecast or my inventory projections?" The Demand Manager looks at all the Excel spreadsheets and replies, "I like your sense of humour."

PERSONALITY OF THE ISSUE - SAM WALTON

A pioneering businessman who broke convention and showed that substantial rebate stores could thrive in small, rural areas, Samuel Moore Walton was born



March 29, 1918 in Kingfisher, Oklahoma. When Walton was a young boy, his parents, Thomas and Nancy, packed up their family and moved to Missouri. An able student and a good athlete, Walton quarterbacked his high

school football team and was an Eagle Scout. Upon his graduation, in 1936, his cohorts named him "most versatile boy." After high school, Walton stayed close to home and enrolled at the University of Missouri in Columbia, where he graduated with a degree in economics in 1940.

"High expectations are the key to everything."
 – Sam Walton

In 1945, Walton utilized a \$20,000 advance from his father-in-law and his savings of \$5,000 to secure his first store, a Ben Franklin franchise, in Newport, Arkansas. From this store itself, Walton launched various concepts that turned out to be of prime variables in his victory. He made it a point that all the racks of the store were always stocked with a large variety of products at cheaper rates. Also, he used to open his store for extended hours than the usual. Walton also established the scheme of offering discount merchandising by buying wholesale products from the supplier giving lowest prices. This pulled in a lot of customers as it was beneficial for them on the savings part. Simultaneously, his changes brought about considerable increase in sales, giving him tremendous profit. In less than two decades, Walton, working with his younger brother, James, came to own 15 Ben Franklin stores. Roused by the early triumph of his dime store, and driven to bring even greater opportunity and value to his customers, Sam opened the first Wal-Mart in 1962 at the age of 44 in Rogers, Arkansas. And, the rest is history.

Walton's vision of a discount retail store in rural areas was accompanied by his hard-charging, demanding .style. Walton, who often began his work days at 4:30 in the morning, expected results from those beneath him, and wasn't hesitant to change course or reshuffle his personnel if he didn't like the numbers that came back

to him. The quest for low prices came naturally to Walton: He was freakishly cheap. Despite the fact that he was stacked up as the wealthiest man in the United States by the 1980s, he continued, it is said, to have his improved hairdo by the local barber, a \$5 expense that he never supplemented with a tip. (Perhaps he wasn't satisfied...!) Cost-cutting was, as one might also expect, an obsession in the Wal-Mart culture, and Walton was almost as chintzy with his executives as he was with his cashiers. On business trips, everyone, including the boss, flew coach, and hotel rooms were always shared. Even a cup of coffee at the office required a 10-cent contribution to the tin. Walton understood that a major

prerequisite for keeping costs down was controlling the payroll. Not only did Walton prefer to hire as few people as possible, but he also dreaded paying them more than he had to. If such a regimen seems

stifling, Walton's employees nevertheless accepted it. Walton's ability to keep his staff happy also relied on a sense of when to let penny-pinching take a backseat to other priorities. In 1971, he introduced a profit-sharing plan that allowed employees to put a certain percentage of their wages towards the purchase of subsidized Wal-Mart stock. For employees who stuck around, this could mean quite a bit of money. According to a truck driver named Bob Clark, quoted in Walton's autobiography: "[Walton] said, 'If you'll just stay with me for twenty years, I guarantee you'll have \$100,000 in profit sharing' ... Well, last time I checked, I had \$707,000 in profit sharing, and I see no reason why it won't go up again."

In 1986, Walton was sensing some pressure to appoint a woman to Wal-Mart's all-male board. So he offered the job to Arkansas' first lady, one Hillary Clinton, who accepted. She would later quote Walton's pitch: "I think I need a woman; would you like to be her?" An avid hunter and outdoorsman, Walton portrayed a humble image right up until his death in 1992. His vehicle of choice was a red 1985 Ford pickup. With his wife Helen, whom he married in 1943, he lived in the same house in Bentonville, Missouri, since 1959. Just a month before his death, Walton was honoured by President George H.W. Bush with the Presidential Medal of Freedom. Behind each and every Wal-Mart store is Sam walton's hard work and success.



SUSTAINABLE SUPPLY CHAIN



MAMATA BANERJEE RANISH BERA
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“The greatest shortcoming of the human race is our inability to understand the exponential function.” —Albert A. Bartle

Supply chain sustainability relates to all processes and activities which lead to an enhanced management of social, economic, financial and environmental impacts throughout the value chain of the process or product lifecycle. It leads to positive long term impacts for all the stakeholders of the supply chain for better management and entails a greater good for the global environment in all possible ways as such.

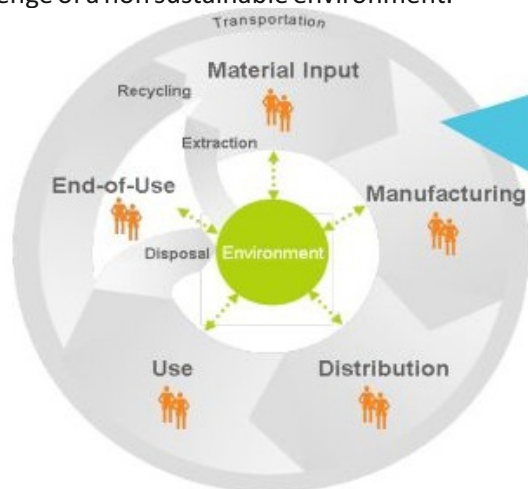
A much talked about phenomena in the business world, it is seen as a platform that can help make businesses and society more protracted with far reaching positive impact for generations to come. It necessitates disentangling ourselves from short term approach and building around sound governance, amalgamating best practices of business management and better policy drivers. It encourages governing bodies to work in coherence instead of performing in silos and create an impact that makes the system well integrated and sustainable for the world, a world that is currently at an inflexion point, with much of its resources extracted and exhausted for our benefits.

A phenomenon that everybody knows and everyone accepts! Still we are yet to see a consummate example of a well rounded sustainable business environment till date. Everyone is aware of it but no one really cares much about it, except a few leaders in the corporate world, even though, they mostly work in non-congruence of business processes. In this article we want to focus on these whys, ifs and buts that have held back organizations from investing enough thought

and capital knowingly and unknowingly. We will focus on general issues rather than industry specific issues.

Benefits to stakeholders

The impact of supply chain sustainability goes beyond any disruption known till date. It has a multi faceted bludgeoning effect globally. It starts with the point of initiation to the point of conclusion for any process or product lifecycle and this is true across all industries. Supply chain expenses looms around to account for 50-70 percent of the total expenses in most manufacturing facilities as per global standards. Right from the stage of extraction to disposal, we can witness an impending challenge of a non sustainable environment.

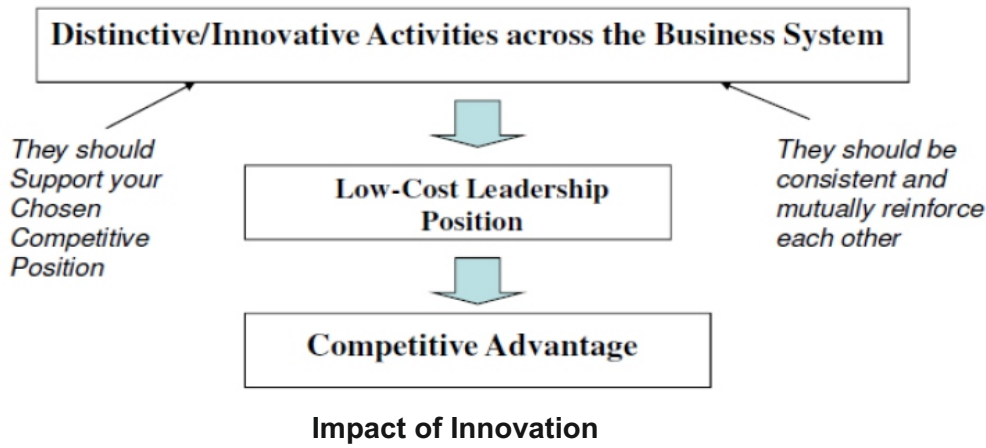


The loss of sustainability in any generic industry at various stages is as below:

It has been globally accepted that supply chain sustainability is not a fancy; it is an imperative to be

MATERIAL	Landfills, Deforestation,
MANUFACTURING	Energy losses, Green House emissions, packaging(paper)
DISTRIBUTION	Transportation using non renewable sources
USE	Loss of resources in maintenance and wear and tear
END OF USE	Wastes, non converted to raw material

integrated in the processes. It's a constant source of differentiation and diversification, both at tangible and intangible levels and a low cost advantage in the long run, though it requires heavy initial investments. It bestows a “premium” status for the customers, “exclusivity and individuality” to the business and enhances “product performance”. It gives a platform for the company for continuous improvement in its business systems and product offerings.



It allows processes to extract benefits of economies of scale and scope and offers a limitless spectrum for improvement. However, cognitive inertia along with action inertia is the biggest killer. One can create a world of difference by applying the aggregation, adaptation and arbitrage model, which means global scale standardization and local responsiveness, getting the arbitrage benefit across processes.

Looking at it from other perspective, due to this differentiation, the companies can charge a premium to its customers since sustainability is in vogue. It's a style statement that people love to flaunt and being associated with such products earns them an exemplary position among their peers. There are responsible citizens of this world who believe sustainability to be the right minded approach and their progressive beliefs help companies pull out those extra currencies that they would, otherwise, may nothave been able to extract. The innovators affect the adopters and hence the chain effect definitely helps the companies achieve a break even faster than they can imagine.

Even for the customer, if the waste is managed effectively and efficiently at the end of its usage, it gives a better standard of living to the people and helps create a self sustainable model. It creates a long term benefit for company shareholders as the future cash flows becomes more enviable for the competitors and the first mover advantage pays off well for a very long period. The environmental benefits are humungous. It creates a framework that ends environmental degradation and supports and enhances the environmental hierarchy to grow. We are able to generate a cleaner and safer surrounding with lesser pollution and deforestation, better water and effluent management can save our scarce non

renewable energy resources for a longer period of time.



Long term and Short term benefits of sustainability

Source: BSR Report by Cody Sisco, Blythe Chorn and Peder Michael

Attempts to Achieve Sustainability :

In the attempt to reduce cost from different parts of supply chain and to be part of the rallying sustainability in vogue, few companies have come up with cost reduction solutions suitable to different stages of supply chain. The different solutions for various stages of supply chain attempt to reduce cost from a particular stage only. In green purchasing initiative the buyer mandates its supplier to comply with the norms for “Environmental Certification”. The production facilities are made to comply with “Green Standards” and “Energy Management” initiatives such as improvement in energy efficiency and adoption of clean fuel technology for energy production eventually help firms to save cost of production.

The negative externalities produced by manufacturing firms are taxed heavily by governments. To reduce tax burden, manufacturing firms reduce the amount of toxic wastes produced from their factories or treat the wastes produced to make it less harmful for the environment. Trucks and other means of transport are used to move materials from plants to distribution centers across the globe. The greenhouse emission due to burning of fuel caused by logistical handling is very scattered, but when added up, amounts to a major chunk of greenhouse emission in the entire supply chain. In an attempt to reduce the cost of outbound logistics the firms are using technology solutions such as route optimization. Usage of alternative fuels is not only reducing cost of operation for firms, but also reducing greenhouse emission. In their warehouses, companies are implementing green energy initiatives to get the benefit of carbon credits and brand recognition. In order to minimize the material usage and fuel consumption, companies are trying to rationalize product development cycle that will reduce material consumption spanning the entire product lifecycle.

The effect of sustainability has a greater impact on human rights and labor as well. That the product is not a shadow of any discrimination or humiliation, or of forced labor, has not been privy to any subjugation or child labor is well enunciated as a part of sustainability measures. This means a lot to the end user and hence carves out an ethical and moral value product that the owner would be happy to use and pay for. Any type of corruption or extortion is also strictly discouraged.

Why Companies are not investing to get Sustainable Supply Chain ?

Even though companies can squeeze costs, reduce uncertainties of supply and create brand value by investing in achieving sustainable supply chain, the efforts of companies in this direction are not convincing enough. There are various hurdles for a company to invest in sustainable supply chain. Few pain points have been enunciated below:-

- **Buyer-Supplier Relationship:** A company's ability to influence its suppliers varies based on the relationship between the company and the
- supplier. Some initiatives with strong financial

returns for both parties will promote change in a supplier's operations, but it is easier said than done. The buyer may not have a significant power advantage over a supplier, the value of sustainability programs is not the same between organizations, and companies don't necessarily have the knowledge needed to work with supply chain communities. To address these issues, companies must make investments in their supply chain as well as that of their supplier's. The companies need to overcome the inertia of investing outside the bounded four walls to be able to do so.

- **Pressure on Financial Indicators:** Nowadays investors ask for consistent good returns on their investments. Any investment decision has to pass the litmus test of "quarterly earnings". With such short term view, investments in supply chain sustainability are not viable because these one-time investments, generally, have a long gestation and payback period.
- **Challenges in Integrating supply chain and product development:** Integrating Supply Chain and Product Life Cycle in an environment plagued with variegated customer tastes is a great challenge. The customers have become so capricious that the product lifecycle has reduced to a few years, in some cases to even a few months! With such short product lifecycles, it is very difficult for companies to integrate their supply chain with their suppliers and distributors to promote sustainability.
- **Poor Awareness in unorganized sectors:** These companies who are small time players are not aware of the benefits of investing in supply chain sustainability. The smaller firms do not have the time or money to invest in the latest findings of academic research or other trends in industries.
- **Perception about Sustainability as "Government Regulation":** Companies perceive that sustainability is compliance with government regulation only. They do not believe that they must think beyond the shackles of governmental policies and aid in making the globe a self sustained replica of the ethical dreams.
- **Multiple parameters to measure sustainability:** Companies are wary of the multiple metrics available to measure sustainability.

Recommendations

In the given scenario, we have to look at how we can work towards a comprehensive approach that can encourage companies to come forth, adapt measures and join hands towards a sustainable environment. Fig 4 models the plausible drivers which can aid to improved sustainability.

- **Role of government:** The environment should be conducive for the companies to invest in this arena without any doubts of conflicting parameters. The regulations and norms that are akin to sustainability should be transparent. The negative externalities, such as greenhouse gases, should have trading markets enabling monetization of the two sided platforms.
- **Engaging with suppliers:** Suppliers see the investments in sustainability as detrimental to their profitability. The buyers should help the suppliers by providing assistance and sharing costs to make the model sustainable and make it a win-win situation. This can be achieved only when the larger firms with deeper pockets develop commitment and can envision the true benefits of sustainability.
- **Industry collaboration:** The companies can focus on sharing of best practices across sectors and benefit from the tools and techniques which may have made a model sustainable. These ideas can be used as transferable skills for other industries. The collaborators can also focus on creating consistency among buyer expectations, reducing inconsistencies and duplication that mar the true benefits of sustainability.
- **Aiding in Financing sustainable practices:** Government bodies, financial institutions and international funding agencies should provide easy financing options for companies that truly want to migrate towards sustainability practices. They can even form a consortium to standardize processes and help in auditing and checking for compliances of such firms. Financing for R&D focused on supply chain sustainability should be well supported by friendly financial instruments which will help build a positive impact on the other organizations and may be in due course will help create a ripple effect to improve the landscape that is so challenged in today's times.



Long term and Short term benefits of sustainability

Source: BSR Report by Cody Sisco, Blythe Chorn and Peder Michael Pruzan-Jorgensen : unglobalcompact@un.org



DID YOU KNOW

Vendor Managed Inventory (VMI)

In the VMI model, there is a cooperation between vendor and retailers to determine the inventory level. The vendor, who knows retailer's sales and inventory information, determines the replenishment frequency and the order size of the retailer. The most important decisions to be made in the VMI model are determining the order frequencies and the volumes of retailer's replenishments. From a general point of view, the VMI leads into a reduction in demand variability, and thus a decrease in the average inventory, which reduces the total inventory cost. In the VMI strategy, an approach called consignment stock is used where the vendor receives the money only when the retailer sells the goods although the goods are physically present at retailers inventory.

TRIPLE 'P' APPROACH (Power, Performance, and Precision) and SUPPLY CHAIN MANAGEMENT

- Dr. Sachin Kamble (Associate Professor)
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Introduction

Supply Chain Management has evolved in various forms, the journey started with SCM philosophy, moved to theory than to concept, flourished as strategies and is currently practiced by every organization for its sustainability. The current orthodoxy in SCM revolves around efficiency and effectiveness which are chasing the universally followed principle to get the right thing at right time and at the right cost. But then the question arises : can effectiveness and efficiency define the term 'right'? Are there any other dimensions which contribute to the principles of getting the 'right'? (Quinn 1997, Farmer, 1997, Inman and Hubler, 1992, Ellram and Cooper 1993, Ragatz et al., 1997; Morgan and Monczka, 1995, Cox et al., 1995, St. Onge, 1996, Lummus and Alber, 1997, The Supply Chain Council 1997).

More than 15 years of academic and consultancy experience of mine reinforces this question assertively; it's not just effectiveness or efficiency but it's how the organizations balance among the three 'P's' – 'P'ower, 'P'erformance and 'P'recision and the approach combining these three Ps collectively named as the Triple P Approach. In this era of cut throat competition for survival, every organization has to adopt multidimensional tactics which vary from chain to chain and among the various stakeholders who form the supply chain. Supply chain management theories and literature's richness are acknowledged among academicians and practitioners since 1980, ranging from supplier strategies to partnership qualities, from tangible to intangible measures, from logistics management to distribution patterns, from layout design to zero defects, from customer satisfaction to the latest environment friendly green supply chain and much more. All the developments, innovations in the theory, frameworks or models were grounded with the base of efficiency and effectiveness. However there is immense necessity to understand the same SCM from Triple 'P' approach perspective.

Power of supply chain lies in its strength to deal with the different uncertainties that it comes across, its flexibility to accommodate changes and in supply chain power is synonym to value. Power can be defined with many aspects but with respect to supply chain Power is defined as 'the ability of a firm to own and control critical assets in markets and supply chains that allow it to sustain its ability to appropriate and accumulate value for itself by constantly leveraging its customers, competitors and suppliers' (Cox et al., 2002). Hu and Sheu (2005) viewed power in terms of a strategy-influencing source that is oriented from one channel member to another. As a result, power is viewed as an effectively applied means to gain certain objectives by utilizing influence strategies, once the power over another firm was attained (Hu and Sheu, 2003; Payan and McFarland, 2005). An examination of all of these definitions of power from different perspectives allows us to conclude that power generally refers to the ability, capacity or potential to get others do something; to command, influence, determine or control the behaviours, intentions, decisions or actions of others in the pursuit of one's own goals or interests against their will.

As essentially, business is about appropriating value for oneself; it is not about passing value to customers unless circumstances decree that this is the only (and it is normally the least desirable) option available to a company in order for it to sustain itself in business. Despite this, it is important to recognise that if one was in this position then assuming that customers value what we provide for them, we would be in a situation of power over the others in our supply chain relationships. This must be the ideal position to be in, yet the concept of power is rarely discussed in supply chain writings except to deny it as important. Both of these views are misguided. This is because most writers operate with a theoretical understanding of the causes of sustainable business success, and focus their analysis on the description of what companies do, rather than have a theoretical understanding of what it is that allows companies to be successful in the first place

It can be argued that companies are only successful if they possess power over something or someone. This is because, only by having the ability to appropriate value from relationships with others whether these are with customers, employees or suppliers can business success be sustained (Cox, 1997). There must, therefore, be objective conflicts of interest between vertical participants in supply chains, just as there are between those competing horizontally in the markets that form around specific supply chain resources. This is because everyone in the chain is seeking to appropriate value for themselves from participation and, assuming economically rational behaviour, must wish to appropriate more of the value for themselves if they are able to do so. Because certain players in the chain recognise that they have limited power to appropriate value from others, is not the same as saying that they would not seek to leverage more value for themselves if circumstances allowed them to do so.

Why is this discussion important? The reason is that in understanding how to manage supply chains strategically and operationally, it is essential that practitioners properly understand the power structures that exist in their supply chains. If they do not, then both practitioners and academics may well be guilty of recommending strategies and operational practices that are inappropriate for the supply chains in which they operate. This is because they may fundamentally misconceive the factors that are causal in the successful appropriation of power.

Performance of the supply chain initiated with the basic argument of this writing is that business success will be derived from companies managing to enhance the total performance of the supply chain, so that it can deliver improved management of supply chain which further improvises the business activity. But it might lead to a million dollar question that How Do Companies Measure the Performance of their Supply Chains?

Academicians, practitioners and research scholars are investing their time, efforts and knowledge to come up with a set of measures and a generalized definition. Few pioneering definitions which describe performance of supply chain are; Performance is defined as the operational excellence to deliver leading customer experience (Simchi-Levi et al., 2003) and Neely et al, (1991) define performance as the process of quantifying effectiveness and efficiency of actions.

It has been widely reported that there has been a revolution in performance measurement in the last 20 years. The enormous interest in measurement has manifested itself in practitioner conferences and publications as well as in academic research (Neely, 1998). The growing importance of the management of supply chains has motivated researchers and practitioners to develop and implement measures that can be used to establish supply chain performance. Performance measurement can only help to identify the problems existing in the current supply chain, while it is helpless in exploring the root causes of these problems and thus choosing corresponding actions to improve supply chain performance (Kocaoğlu et al, 2013). There are number of definitions added to body of knowledge by numerous authors.

“If you have to forecast, forecast often.”
— Edgar R. Fiedler

The measurement of supply chain performance requires the creation of an inter-organisational and intra-organization assessment system. Such systems can feasibly be used to identify opportunities for improved supply chain efficiency and competitiveness, to help understand how companies operating in supply chains affect each other's performance, to support the supply chain in satisfying consumer requirements and to assess the result of an implemented initiative (Lyons et al, 2012). Performance of supply chains is measured on the basis of appropriate key performance indicators (KPI) of the firm. Three supply chain measures set (SCS) are evident in SCM literature: cost efficiency, time responsiveness and hybrid of the two which are popularly studied as financial measures. With precision, if the performance of supply chains is measured, then it will be recognized as critical feature in gaining competitive advantage for every organization as it is rightly said which can get measured is better controlled, which in turn is the answer for the basic objective of the organisation to know 'where they are and where they want to go'.

Precision means accuracy in almost every process which is and are the integral part of supply chain, whether the precision required is in information sharing or demand forecasting, managing quality or design of goods and services, process strategies or capacity planning, inventory management or human resources management etc. Precision in decision making determines the smooth or precarious functioning of supply chain. It's difficult to get a definition in literature that defines precision of supply chain, as there are no specific KPIs or strategies or practices which determine precision, is more about the management thinking, than what exactly is management thinking? *"a way of thinking that is devoted to discovering tools and techniques that provide for increased operational effectiveness and efficiency throughout the delivery channels that must be created internally and externally to support and supply existing corporate product and service offerings to customers". - Cox, 1997*

This way of thinking has its lineage in the work that will lead to the phenomenal success of the organization or its supply chain.

Conclusion

Goals need to be challenging, but also realistically achievable. So far all the three 'P' are addressed in silos which result in some or other deficiency in the supply chain. Thus the need of the hour for every organization is to combine the three 'P's. This Triple 'P' Approach when integrated possess the potential to change the scenario of the organization. The conclusion that can be drawn from this article is, that there cannot be any one single approach to supply chain management that is appropriate in all circumstances. Clearly, certain approaches will be more or less conducive to particular supply chain structure. While there are still considerable ways from completing and competing the proper analytical categorisation of supply chain power types, performance measures and precision, the linkage of these triple 'P's with the most appropriate management strategies for appropriating value, I believe would be the first step in that direction.

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New Product Development in FMCG companies



**Mr. Praveen Raj (PGDIM 2010-12),
Johnson and Johnson India Ltd.**

One of the most essential factors for companies to sustain in this competitive era is Innovation backed by R&D. It is very much needed that companies introduce a new product before another product in their portfolio reaches the decline stage of its life cycle. Matching dynamically changing customer preferences is the key cause behind New Product Development (NPD).

As per a report, 70% of all new product launches fail in the first year. Following important factors need to be considered before launching the product:

- **Alignment to customer needs:** The “Washy Talky” washing machine launched by Electrolux India proved to be a total failure. The market showed no big need for a washing machine that talks.
- **Differentiating advantage:** Ponds gained a first-mover advantage. It was the first to come up with a deodorant manufactured in India suited for Indian conditions.
- **Marketing plan:** Montage, a soap launched by Burroughs Wellcome failed to sustain in the market, since it overlooked the fact that consumers buy soaps along with their grocery items. The soap was sold in drug stores through chemists.
- **Timing:** Kellogg's cornflakes had to wait for several years in India until the market could accept cornflakes as a breakfast item.
- **Product quality:** Kinetic Merlin, which was launched as a three-in-one set, consisting of a colour television, a stereo with detachable speakers and a home computer suffered a loss. The major reason for the failure was that if the TV was kept switched on for more than four hours, the set would heat up, which used to affect the functioning of the home computer.

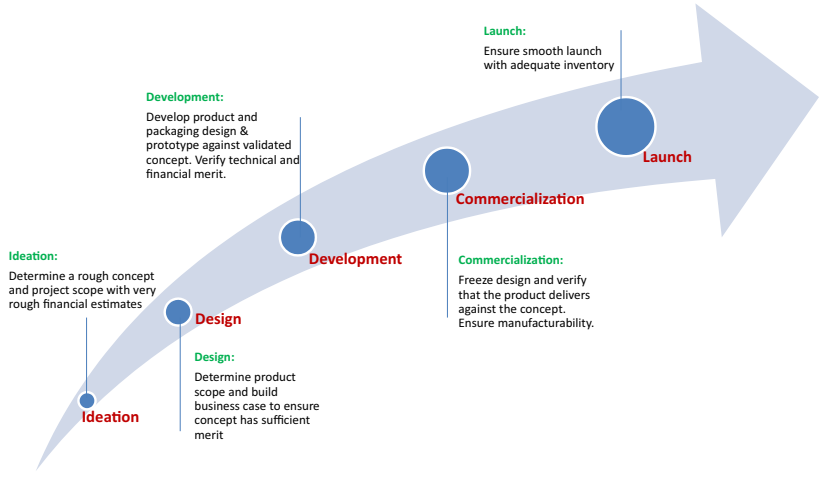
- **Access to market:** Pepsi's Ruffles chips failed due to lack of distribution support from its dealers.

All this calls for an in-depth understanding of the stages before introducing a product and ensuring that each stage is fool proof. The different kinds of projects that come under NPD are:

- **New Product development** – Development of a new formulation of a product altogether from the scratch
- **New Product Introduction** – Introduction of an already existing product in other countries. It is usually a technology transfer.
- **Non NPD/NPI** – Promotional offers and consumer offers and one time sale SKUs

There is a 7 stage process that is generally followed for NPDs

- **Ideation:** This stage involves both individual and group brainstorming to help generate an idea for the new product. After screening of ideas, rough financial estimates for the project are done.
- **Define:** Here commercial aspects come into the picture. SWOT analysis of the product, competitor analysis, market segmentation and target group decisions are taken in this stage.
- **Design:** The concept is converted into preliminary version or prototype of the product. The prototype is compared with the financial estimate done in the previous stage and ensured of compliance of all technical features expected from it.
- **Development:** An analysis of manufacturability is done in terms of optimizing all functions right from fabrication to assembly, testing and dispatching. All chosen processes should provide best cost, quality, reliability, regulatory compliance, safety, time-to-market and customer satisfaction.



Process of New Product Development

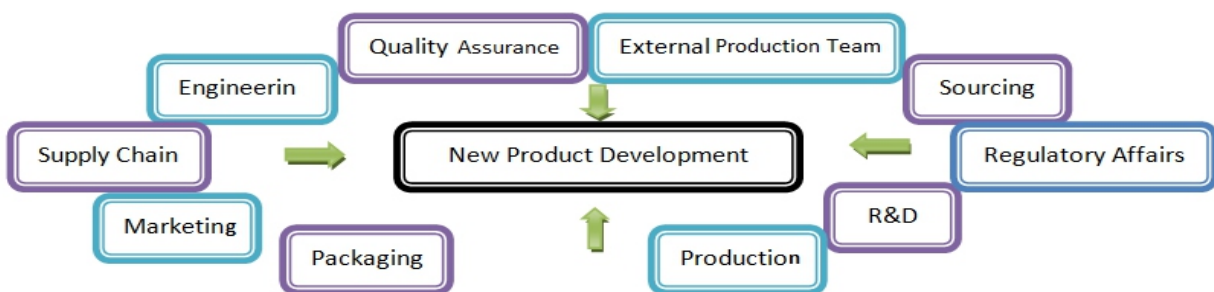
In today's dynamic global marketplace, increasing logistics flexibility is critical as shippers look for greater collaboration with their third-party providers on the way to seamless integration of supply chain activities.
 - Patrick Burnson

- **Commercialization:** It is the process of deciding when to launch, where to launch and how to launch. Marketing efforts, promotional plans and advertisements are taken care of in this stage.
- **Launch:** Based on forecast of requirement, ensure adequate stock and inventory and launching in the market
- **Post Launch**
- Following the market and customers to look for any defect/complaint reported by the users.
- Providing adequate after sale services and taking feedback for any change/improvement.

close to 2 years. For a non regulated product, launch usually takes 8 to 12 months. NPD involves cross functional teams and high level interaction among departments for implementation of these projects. Regulatory submission and approval (only for a regulated product) will happen after stability testing of pilot batch.








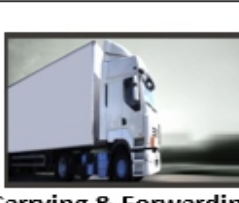
The general flow of the activities followed is given in the table next page. Thus it is clear that new product development involves years of preparation, complex interdepartmental interactions and iterative processes involving feedback and improvements until the product becomes stable in the market. All FMCG companies need to be quick to adapt to the changing trends and continuously bring in elements of innovation and creativity to beat the competition. After all the only law dictating the market is – 'Survival Of The Fittest'.

The Timeline perspective of a project depends on the kind of product that is going to be launched. If it is a regulated product, then it has to be approved by the FDA – so the whole launch will typically take

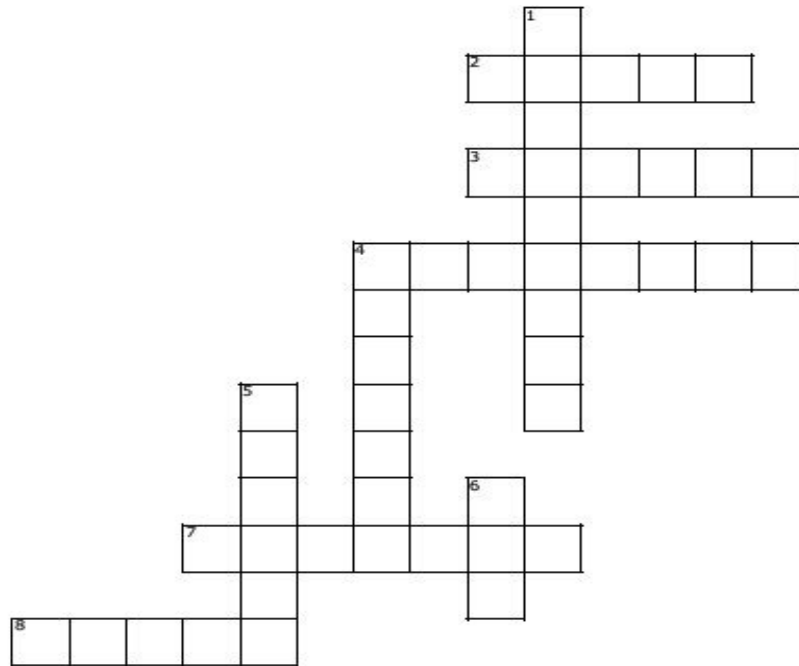


Cross functional team for New Product development

The general flow of the activities followed is as follows:

1	 <p>Market Research</p>	<p>A new product requirement's idea creation happens after market research and marketing proposes the idea. <i>For example:</i> McDonald's understood that Hindus forming 80% of Indian population reverve cow as sacred and 150 million of Indian Muslims do not eat pork. So it introduced mutton based 'Maharaja Mac' instead of its flagship beef based Big Mac elsewhere.</p>
2	 <p>Demand Forecasting</p>	<p>Future volume plan to be worked out by marketing team <i>For example:</i> When Kellogg's Corn Flakes entered Indian market, they were aware of the eating habits of Indian society and were willing to invest in evolving it. The company had planned for 25 years wherein they intended to increase production gradually.</p>
3	 <p>Financials</p>	<p>Based on this volume, supply chain team will work out the financials and prepare a business case which includes Net trade sales, Net realizable value, Advertisement & Promotional expenses, Cost of goods sold (COGS), Any Capital expenditure like new machinery, tooling etc; if required, Gross profit, Payback period and Internal rate of return.</p>
4	 <p>CAPEX Expenditure</p>	<p>This business case will be reviewed and approved; and budgets will be allocated for capital expenditure and trial run costs. Capex plan will consider expenditure related to acquiring fixed, and in some cases, intangible assets, repairing an existing asset so as to improve its useful life, upgrading an existing asset if it results in a superior fixture, preparing an asset to be used in business, restoring property or adapting it to a new or different use etc.</p>
5	 <p>Manufacturing Site</p>	<p>Manufacturing site and Bill Of Material specifications will be finalized. Decision regarding new manufacturing site to be opened or to continue with existing plant with proper capacity planning is taken based on quantity to be made and also considering if the product will be a regular or seasonal.</p>
6	 <p>Pilot Testing</p>	<p>Actual product pilot testing of products is done. Stability testing of these pilot batches are done and approved. <i>For example:</i> J&J's highly anticipated Alzheimer's drug, bapineuzumab, failed to improve memory and thinking skills in closely watched clinical trials of people with mild to moderate forms of the disease.</p> <p>Once this is done, Marketing claim for the product will be finalized after consumer utility testing and lab testing.</p>
7	 <p>Packaging</p>	<p>Post this, Packaging artwork along with claims will be developed. <i>For example</i> Treasure Easter eggs by were introduced Cadbury in 2008, packaged in foil minus the traditional egg box. The company touted the fact that the new packaging uses 75 percent less plastic, 65 percent less cardboard and saves 2,000 trees. This helped them reduce packaging cost.</p>
8	<p>Validation</p>	<p>Product and process validation will be conducted and Launch volumes and trade schemes are finalized.</p>
9	 <p>Carrying & Forwarding Agents</p>	<p>Launch volumes are shipped to the Carrying & Forwarding Agents which is carefully chosen considering many criteria. It undertakes the activities like receiving the goods from the factories or premises of the principal or his agents; warehousing these goods; receiving dispatch orders from the principal; arranging dispatch of goods as per the directions of the principal by engaging transport on his own or through the authorized transporters of the principal; maintaining records of the receipt and dispatch of goods and the stock available at the warehouse.</p>

SUPPLY CHAIN CROSSWORD



Across

- 2. / Fixed Quantity models are ____ triggered.
- 3. Wiggly / In 1950 delegation from Toyota visited USA for TPS inspiration in this company
- 4. / Prohibiting product from being taken out of its fixture due to quality defects as a result of machine or operator action
- 7. / According to ACAT in risk management, C stands for:
- 8. / Forecasting model mostly suited for the data that has varying levels and trends with seasonality and long shelf life

Down

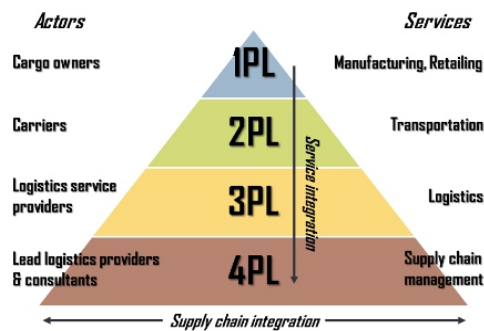
- 1. to promise / is a business function that provides a response to customer order enquiries, based on resource availability
- 4. / This Production system requires fixed system robot layout: ____ Layout
- 5. / Japanese term for creating flow and eliminating waste used in TPS (Toyota Production System) can be defined as "automation with a human touch"
- 6. / Point at which ordering cost = holding cost.

DID YOU KNOW

Third Party Logistics (3PL) and Fourth Party Logistics (4PL)

Third Party Logistics is the activity of outsourcing activities related to Logistics and Distribution. The 3PL industry includes Logistics Solution Providers (LSPs) and the shippers whose business processes they support.

A 4PL is neutral and will manage the logistics process, regardless of what carriers, forwarders, or warehouses are used. The 4PL can and will even manage 3PLs that the customer is already currently using.



Many 4PL players have addressed the huge requirements of electronic interface between numerous companies.

Solution
 Down
 1. available
 4. product
 5. Jidoka
 6. eqq
Across
 2. event
 3. piggy
 4. pokayoke
 7. control
 8. arima

Who We Are...

C2X, Chain to Excellence, the supply chain forum is an endeavor by students of NITIE to catalyze the supply chain interests and to bring awareness about up-to date industry best practices and latest supply chain innovations. In this current age, where the competition is no longer between the organizations but between their supply chains, C2X is an initiative where NITIEans do their bit to bring out the best of the industry to one and all

The forum aims at being an interface between industry and academics. The raison d'être of C2X is to supplement the teachings at our institute. Our activities focus on enlightening the students on Supply Chain by conducting various group activities, guest lectures, case studies and knowledge sessions etc.

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Nitin
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Ramkumar
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Aipt
Saxena



Varun
Elango