SUPPLY CHAIN DYNAMICS, AGILITY AND RELATIONSHIP MANAGEMENT: BSS 421

WEEK 9: TECHNOLOGY AND SUPPLY CHAINS

BY

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Review of Last Week's Task

1. Identify the type of complexity that is causing the greatest challenge to performance of an organization you work for.

2. If you are not working, identify challenges that may be affecting a retail outlet from where you buy merchandise. Trace any supply chain of such a retailer and explain source of challenges.

Possible Solutions to our last week's Task

1. **complexity causing the greatest challenge to performance of an organization you work for.**

   Complexity can be from bullwhip effect, internal variability, supply chain risks and competition from other supply chains.

2. **Identify challenges facing retail outlets.**

   Complexity is mainly from shorter supply chains of efficient large scale producers and local supply chains.

Recap of Last Week's Topic

We discussed on sources of supply chain complexities. These were;

1. Production approaches as a source of supply chain complexity.
2. Bullwhip effect as a source of supply chain complexity
3. Internal systems variability as a source of complexity
4. Supply chain risk as a source of supply chain complexity

Objectives of Week's Topic

Overall objective is to describe technologies that support supply chain processes and the related supply chain dynamics.

Specific objectives are -;

1. Identify supply chain processes.

2. Identify technologies that support the supply chain processes

3. Explain the relationship between supply chain processes, technologies and supply chain dynamics.

Supply Chain Processes

Croxton et.,al, (2001). Pg1-13 Identified the following as supply chain processes

- Customer Relationship Management
- Customer Service Management
- Demand Management

Order Fulfillment

- Manufacturing Flow Management
- Procurement
- Product Development and Commercialization
- Returns

Croxton, K.L., García-Dastugue S. J. , Lambert ,D. M., Rogers, D. S., (2001)
The Supply Chain Management Processes.
International Journal of Logistics Management,
DO - 10.1108/09574090110806271

Supply Chain Processes

1. **Customer Relationship Management :** Requires determination of who the key customers the value they bring to buyer or supplier and how the relationship is to be managed.

2. **Customer Service Management**. Involves how to relate with customer at the point of contact with the organization. Real time information on customer requirements, production or provision of services and transportation of the supplies to the customer is required.

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3. **Demand Management** : Requires management of erratic demand by the customer and variability of inventory in the pipeline or in the store.

Supply Chain Processes

4. **Order fulfillment**: The key activity in this process is establishing the dates of delivery and lead times. Supply of input, production , distribution and transportation. These should be coordinated in a way that is seamless . The supplies should be provided on or before the deadline.

5• **Manufacturing Flow Management**: In traditional supply chains manufacturing is based on forecasting or historical data. Manufacturing leads to high inventory and high inventory costs. In flexible manufacturing, production is well matched with the customer demand.

Supply Chain Processes Cont'd

6. **Procurement**

- It involves strategic identification of the suppliers who are able to support product development and production by the buyer.

- In well managed collaborations, procurement process goes beyond ordering and expediting the order. Buyer and supplier plan and execute the orders for the mutual benefit.

- In some organizations where procurement is critical, buyer is involved in supplier development if such a supplier is not at the same level as the buyers.

Supply Chain Processes Cont'd

7. Product Development and Commercialization; Buyer and supplier are incorporated in product development and commercialization for three reasons.

- Identifying the needs of the customer in order to develop a product that will have a demand.

- Shorten the period of launching it into the market by identifying and acquiring the right materials that are necessary for production.

- Acquire the technology that is required for manufacturing.

Supply Chain Processes Cont'd

8. **Returns:** It is the management of flow of goods from the customer to the producer for competitive advantage, refill, disposal or recycle.

Technologies are therefore suited to the processes that are contingent to a business.

NATURE OF SUPPLY CHAINS

Schrauf, S. & Berttram ,B. (2016) P11. divides supply chains into

1. Traditional supply chains

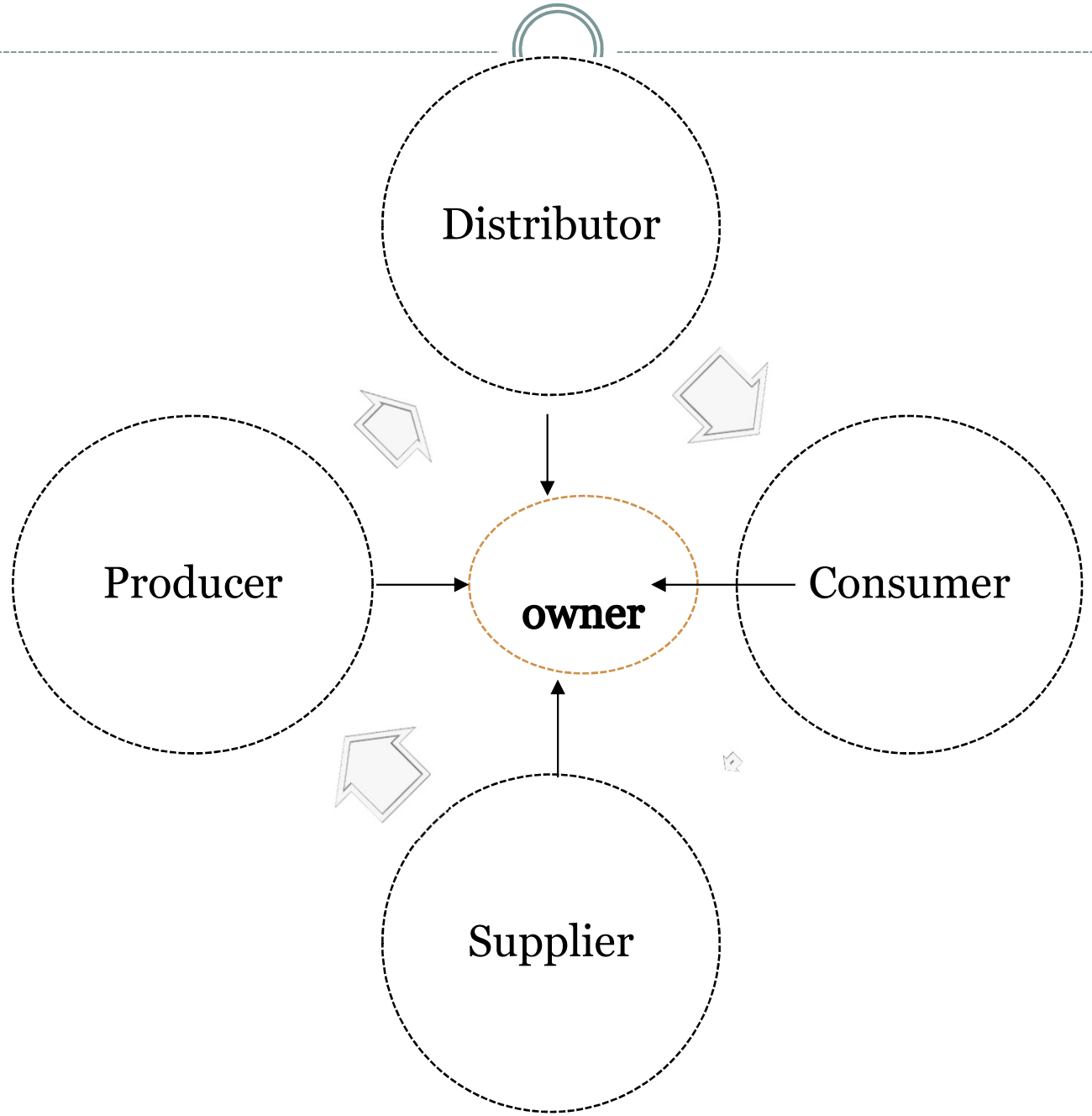
Supplier → Producer → Distributor → Consumer

Key tasks were order , plan and deliver . They were linear and simple .

2. Integrated Supply Chains. These are modern
They have a business owner with whom business is transacted. Ke tasks include ordering, quality management, confirming the orders and tracking the orders. These supply chains are illustrated in the next diagram.

Schrauf, S. & Berttram ,B. (2016) P11.
How digitization makes the supply chain
more efficient, agile, and customer-focused.
WWW.strategy&pwc.com

Nature of Supply Chains Cont'd



Key Supply Chains Technology requirements

Chikwanda & Zulu (2021) Identifies the following as supply chain technology requirements.

1. **Information technologies;** These are technologies for communicating business information between the producer, supplier, distributor, customers and with operations facilitators in the organization.

2. There are four main types of communication that are used on a daily basis. These are verbal, non-verbal, visual and written communications.

Key Supply Chains Technology requirements Cont'd

Information technologies Cont'd:

Tools that facilitate communication are; mail, email, telephones, cell phones, smartphones, computers, video and web conferencing tools, social networking, online collaboration and productivity platforms.

Social networks widely used are Facebook , WhatsApp, YouTube, Instagram, WeChat, TikTok and telegram. There are many others that are widely used depending on availability, cost and the use that they can support.

Buyers and suppliers have embraced these for internal and external communication.

Key Supply Chains Technologies

Automatic Identification Technology (Auto Id). These are;

1. Barcoding
2. Radio frequency identification (RFID)
3. Voice Recognition
4. QR codes
5. Biometric

The automatic identification technology is used for tracking containers, packages,

Key Supply Chains Technologies

- RFID enables contactless reading of information from a distance. This helps tracking large information in containers

- Voice Recognition; A voice interactive technology incorporates voice in communication in logistics operations. It allows an operator of the system to communicate data hands free.

- Biometrics are important for accountability

Key Supply Chains Technology requirements

3. Communication Technology:

- Electronic Data Interchange (EDI) is the automated exchange of business documents between organizations. Routine workflows require the exchange of documents like invoices, purchase orders, and emails. Only those with permission can access.
- **Very Small Aperture Terminal (VSAT).** Uses satellites enabled communication and it is used for transport logistics.
- **The Global Positioning System (GPS)** is a navigation system used to synchronize location, speed and time data for travelling by air, road and sea. It is used for tracking containers.

Key Supply Chains Technology requirements

Management systems.

1. **Material Requirement Planning (MRP I);** Purely is a production and Scheduling system in a production line. It is used for planning and controlling for manufacturing inventory in a way that no stock outs occur
2. **Material Requirement Planning (MRP1I); Is** an extension of MRP I. It links together departments such as production and planning; procurement: etc. into an integrated decision-making supporting systems. The production process is driven by a master production and inputs from organization functions.

Key Supply Chains Technology requirements

Management systems.

3. Enterprise resource Planning (ERP): It is an information system that integrates all functions of an organization by providing real-time information to all stakeholders. It connects both Finance module, Supplier management module, production module etc.

Key Supply Chains Technology requirements

Important supply chain modules found in ERP.

1. **Vendor-managed inventory system (VMI)**

the manufacturer is responsible for producing and controlling the inventory at the retailer's distribution center and, in some cases, also at the store level. Stock is monitored and replenishment automatically.

2. **Warehouse management system (WMS**)

Integrates all aspects of inventory management and optimizes all warehousing functions. The system provides the information necessary to manage and control the flow of products in a warehouse, from receiving to shipping.

Key Supply Chains Technology requirements

Important supply chain modules found in ERP.

4. **Electronic Point of sale (EPOS**): It uses radio frequency identification (RFID) and barcode labeling to record sales at point-of-sale terminals, which are connected to information systems. This system can be integrated with inventory management systems, to activate the automatic request and replenishment of inventory. Data on the current inventory and cost structure of each product are stored in a centralized database and communicated in real time .They are key to big retail outlets.

Key Supply Chains Technology requirements

Important supply chain modules found in ERP.

5. **Procurement Management Information System (PMIS)**

PMIS is a system that automates functions for document management, communication and procurement processing to facilitate and standardize the procedures of procurement by using information communication technology solutions. A buyer can publish standard documents of procurement such as the tender documents, request for proposals, request for quotations, contracts; procurement and asset disposal laws and regulations, procurement manuals and procurement opportunities for the supplier to bid. PMIS uses updated central data warehouse to record, track and verify the history of procurement and capabilities of current suppliers, contractors and consultants.

Key Supply Chains Technology requirements

Decision support system (DSS)

It is an interactive software-based systems intended to assist managers in decision making by accessing large volumes of information generated by various related information systems involved in the organization's business processes.

Information Technology and Supply Chain Dynamics

1. **Robotic Process Automation (RPA).** It is a technology used to automate routine and repetitive tasks. This technology is improving the efficiency and accuracy of processes, reduces costs, and provides better customer experience

2. **Internet of things IoT's.**
   impact extends to inventory management, where sensors monitor stock levels, expiration dates.
   Predictive Maintenance. IoT devices embedded in machinery vehicles can monitor equipment health in real-time.
   Enhanced visibility and tracking product location.

Information Technology Supply Chain Dynamics

Artificial Intelligence (AI)
(AI) powered solutions have the potential to revolutionize stock management due to their capacity to handle massive amounts of data. They can rapidly analyze and interpret huge datasets, delivering real-time actionable insights for demand and supply planning.

Big Data Analytics
Uses data and quantitative techniques to aid decision-making at all supply chain stages.

Blockchains
Distributed ledger technology because it aids in tracking and securing data in multiple cites.

Information Technology Supply Chain Dynamics

Cloud computing

It enables working simultaneously from anywhere and it helps managers to assess work being done at any time.

Information Technology and Supply Chain Dynamics

- These emerging technologies are changing the way supply chains have always operated. They favour the well established Companies who have financial capability to purchase them and the knowledge of building them.

- This will create a bigger gap in supply chains of developed and less developed economies.
- They will enjoy more economies of scale

- Bigger manufacturers will have capability of accessing very remote markets.
- Applications can also be created and disrupt supply chains from anywhere in the world.

Task for next week

1. List down number of technologies that we have discusses that you knew before.

2. I identify new technologies that are driving businesses in your area .

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THANK YOU ALL

WISHING YOU WELL

HAVE A LOVELY WEEK