LOG 206

M6: Digital Supply Chain Management

Department of Logistics

Molde University College

Spring 2018

Høgskolen i Molde
Vitenskapelig høgskole i logistikk

Take Apple’s products as example

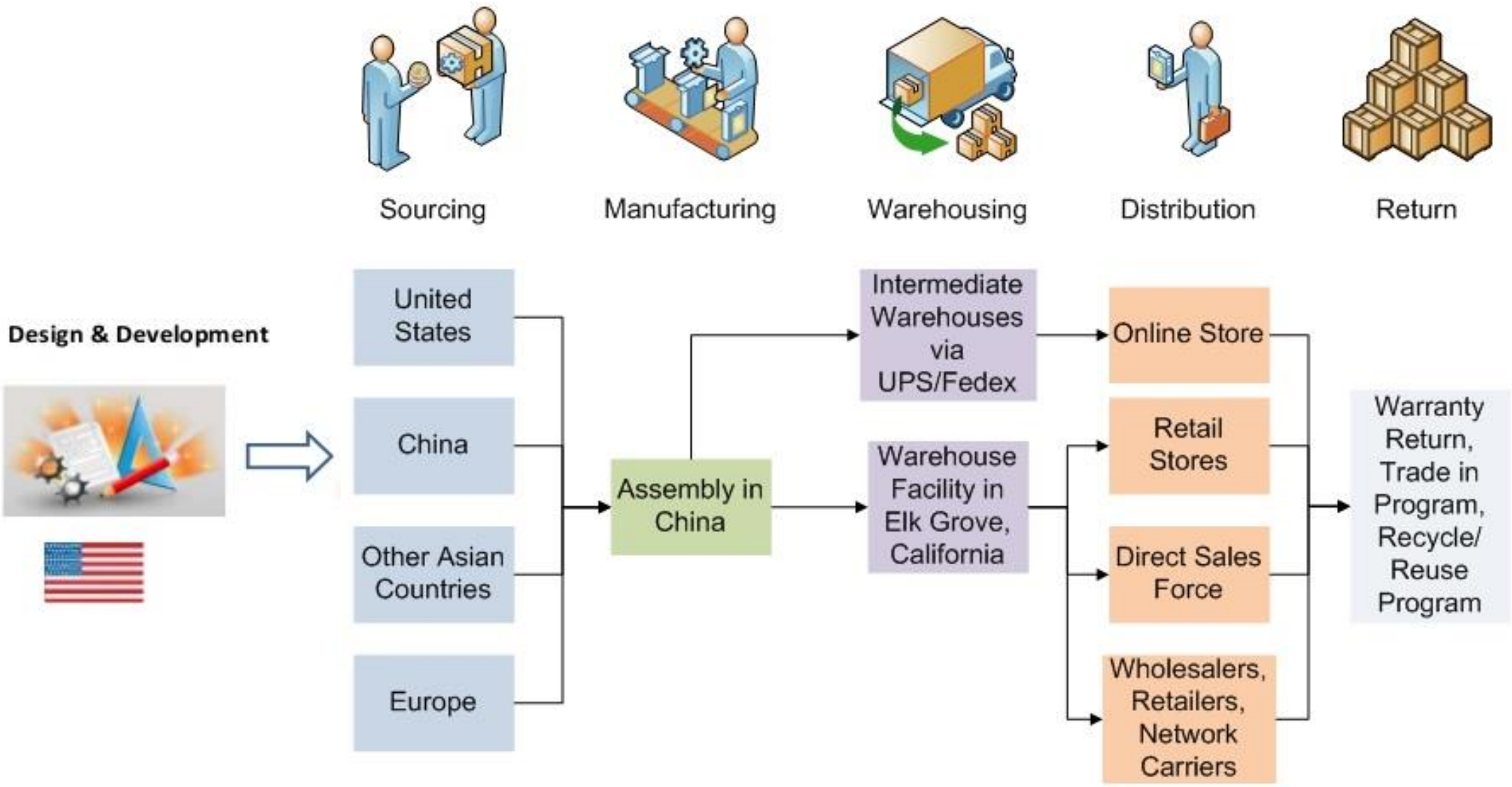
Mac

iPod

iPhone

iPad

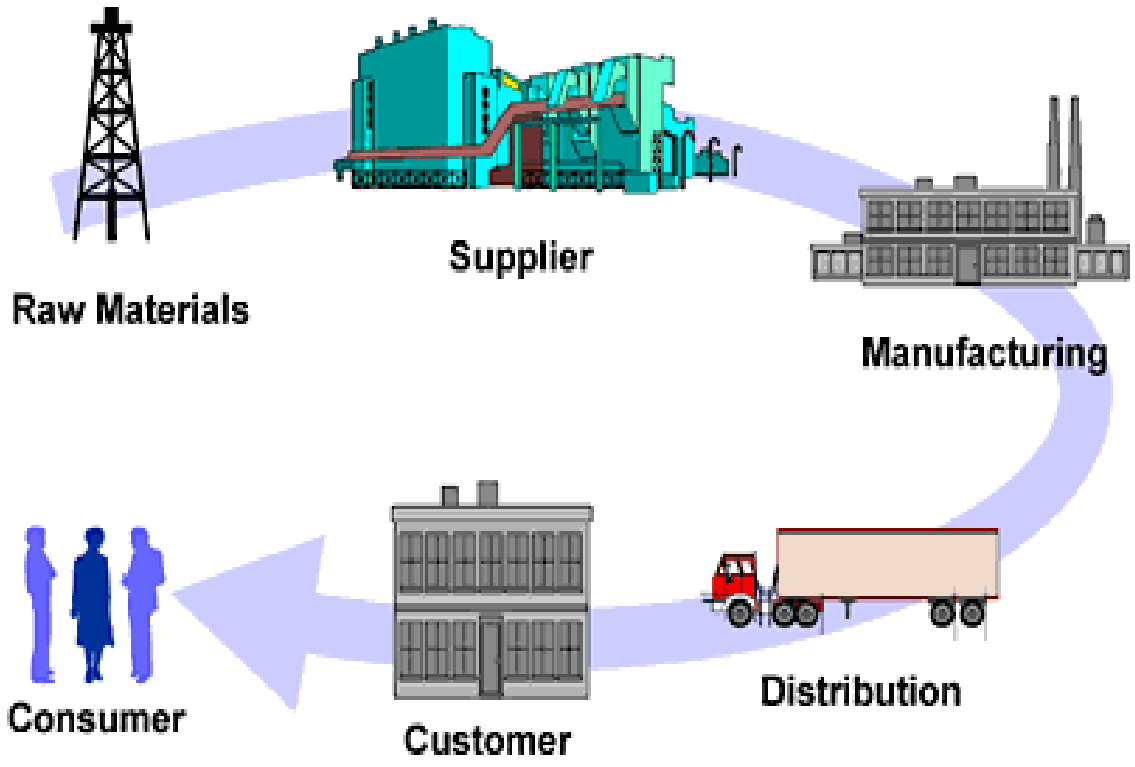
Let us look at their flow (simplified)



Supply chain

For most products, several entities are involved in the process of getting them to the customers.

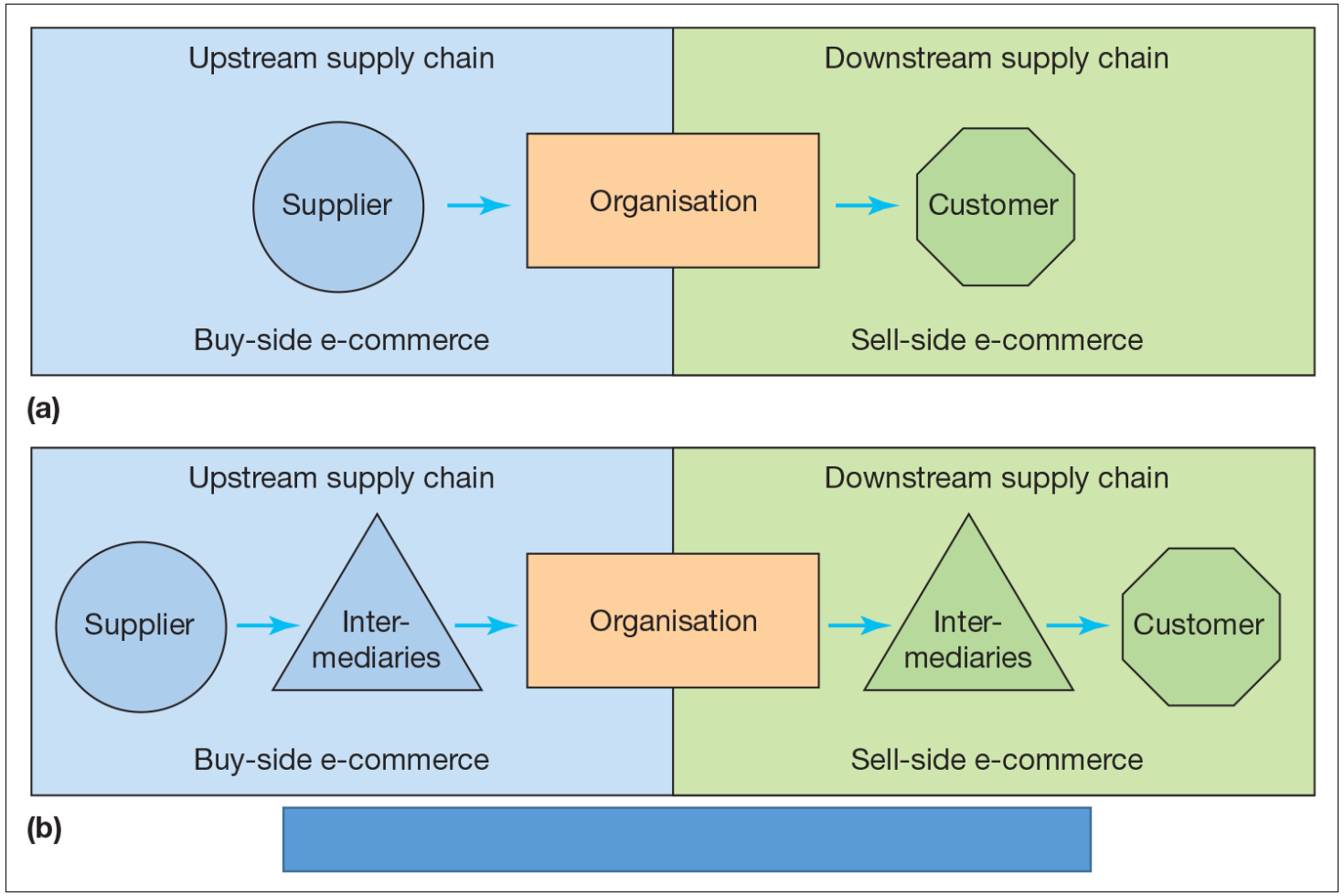
A supply chain is a system of organizations, people, activities, and resources involved in moving a good or service from point of origin to end customers



Members of the supply chain

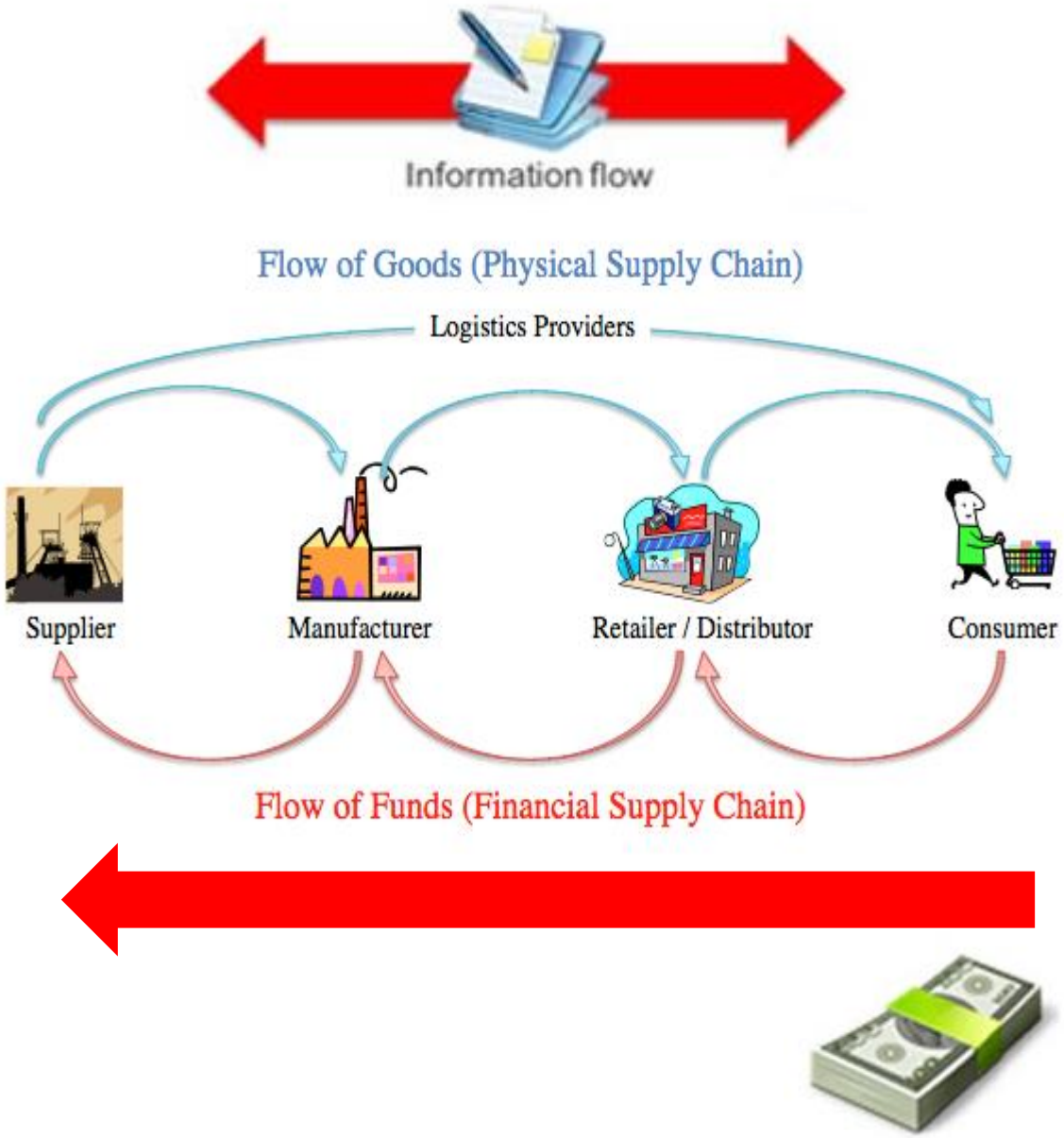
(a)Simplified view

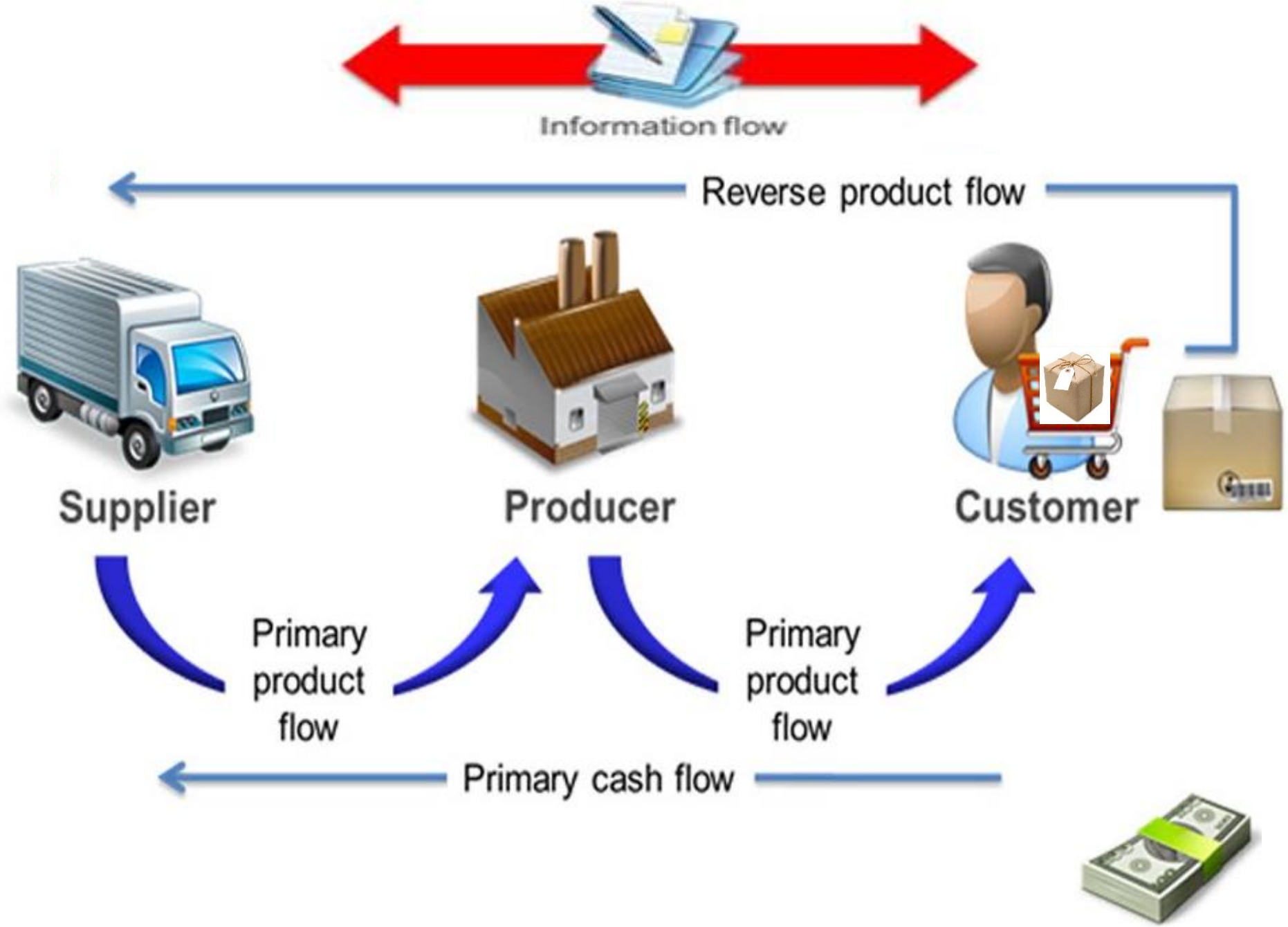
(a)Including intermediaries



Supply chain flows

The interaction between entities in a supply chain is characterised by flows of materials, information and funds.




Information flow
Reverse product flow
Supplier
Producer
Customer
Primary product flow
Primary product flow
Primary cash flow

Apple is a success story.....

Apple Just Had The Most Profitable Quarter Of Any Company Ever

Posted Jan 27, 2015 by Greg Kumparak (@grg)

32.9k SHARES

Apple had a pretty g

And by "pretty good,
any company. Ever.

Why Apple is the most successful company in history

I'm going to give you 11 reasons why Apple is way more successful than you think.

What Makes Apple So Special and Desirable?

Some Aspects that Make Apple Stand Head and Shoulders Above the Rest

Share Pin Email PRINT

by Priya Viswanathan

Updated August 25, 2017

Apple has been at the top of the game for several years now. Be it releasing new and

Among other things, apple's success comes from best supply chain practices……

The Gartner Supply Chain Top 25 for 2011

Rank	Company	Peer Opinion 1 (156 voters) (25%)	Gartner Opinion 1 (32 voters) (25%)
1	Apple	2950	536
2	Dell	1909	457
3	P&G	1726	660
4	Research In Motion (RIM)	550	215
5	Amazon	2267	402
6	Cisco Systems	1501	550
7	Wal-Mart Stores	1755	449
8	McDonald's	711	161

The Gartner Supply Chain Top 25 for 2012

Rank	Company	Peer Opinion[1] (173 voters) (25%)	Gartner Opinion[1] (37 voters) (25%)
1	Apple	3241	651
2	Amazon	2713	435
3	McDonald's	1121	283
4	Dell	2131	546
5	P&G	1940	622
6	The Coca-Cola Company	1818	372
7	Intel	1006	406
8	Cisco Systems	1243	582
9	Wal-Mart Stores	1874	410
10	Unilever	1043	534
11	Colgate-Palmolive	697	342

The Gartner Supply Chain Top 25 for 2013

Rank	Company	Peer Opinion 1 (172 voters) (25%)	Gartner Opinion 1 (33 voters) (25%)
1	Apple	3,203	470
2	McDonald's	1,197	353
3	Amazon.com	3,115	475
4	Unilever	1,469	522
5	Intel	756	515
6	P&G	1,901	493
7	Cisco Systems	1,167	517
8	Samsung Electronics	1,264	298

The Gartner Supply Chain Top 25 for 2014

Rank	Company	Peer Opinion (1) (188 voters) (25%)	Gartner Opinion (1) (32 voters) (25%)
1	Apple	3187	371
2	McDonald's	1612	369
3	Amazon.com	3171	510
4	Unilever	2031	517
5	P&G	2166	513
6	Samsung Electronics	1871	351
7	Cisco Systems	1092	480
8	Intel	908	475
9	Colgate-Palmolive	891	322
10	The Coca Cola Company	1820	265
11	Inditex	751	259

GARTNER SUPPLY CHAIN TOP 25

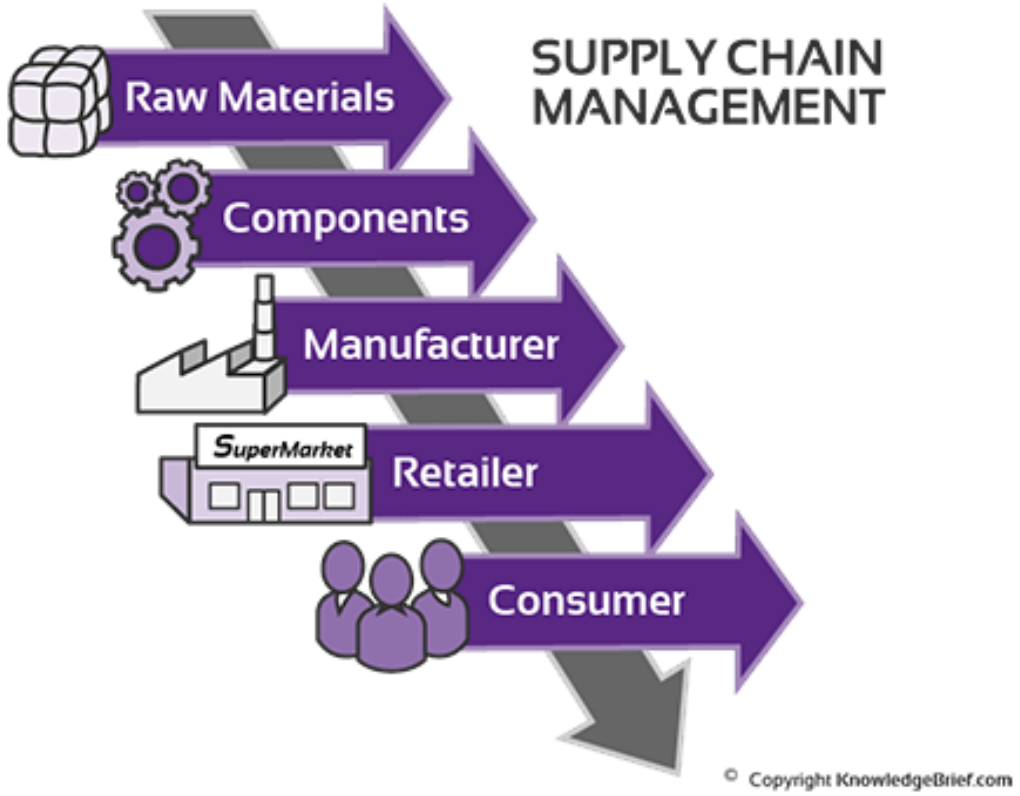
2017 2016 2015 2014 2013 2012

Master Apple*
Master Procter & Gamble*
Master Amazon.com*
1. Unilever
2. McDonald's
3. Inditex
4. Cisco Systems
5. H&M
6. Intel
7. Nestlé
8. Nike
9. Colgate-Palmolive
10. Starbucks
11. PepsiCo
12. 3M
13. Johnson & Johnson
14. The Coca-Cola Company
15. Nokia
16. BASF
17. Schneider Electric
18. Wal-Mart Stores
19. HP Inc.
20. L'Oréal
21. Kimberly-Clark
22. BMW
23. Diageo
24. Lenovo
25. Samsung Electronics

* Masters category: Highlights the accomplishments and capabilities of long-term supply chain leaders in the Top 25. Companies qualify for the Masters category if their composite score places them in the top 5 rankings for at least 7 out of the past 10 years.

Supply chain management (SCM)

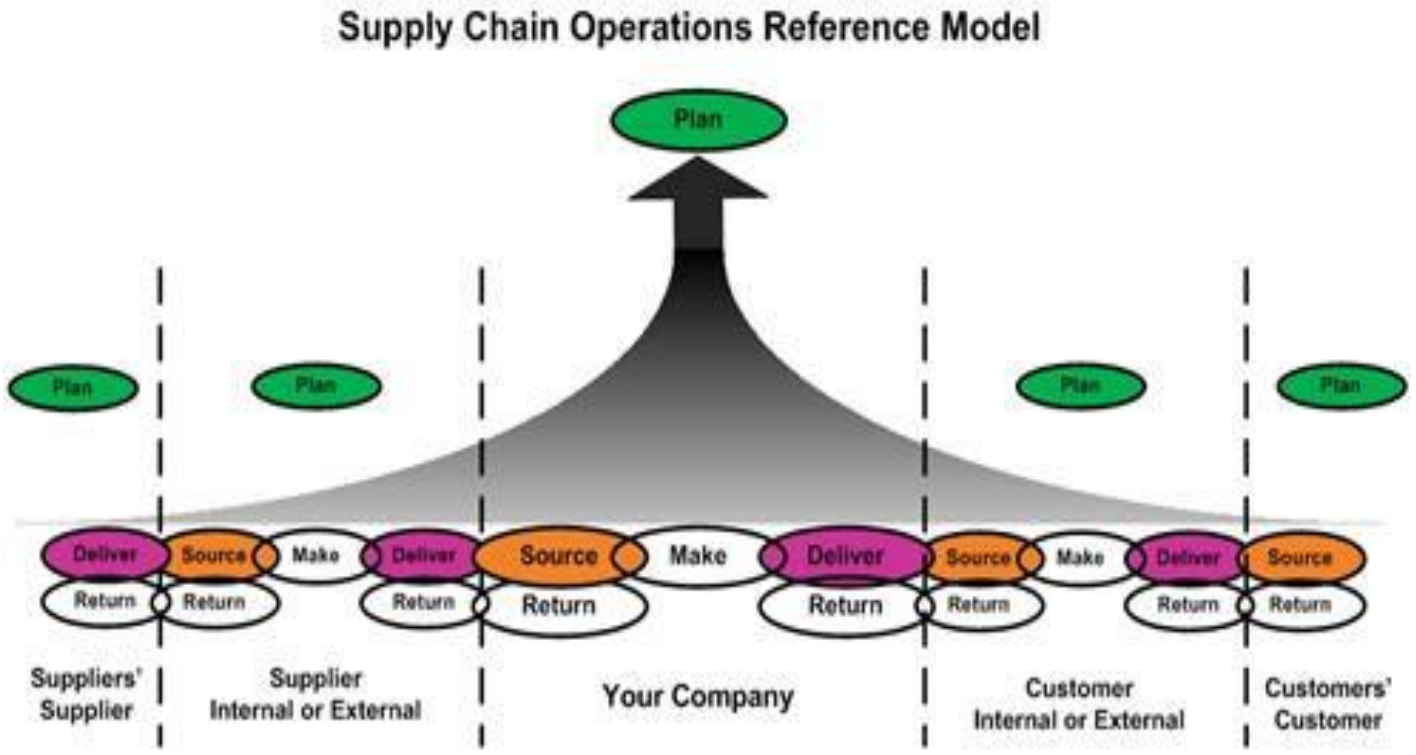
- Supply chain management involves the coordination of all supply activities of an organisation from its suppliers and delivery of products to its customers
- Supply chain management is essentially the optimization of flows involved in a supply chain
- The objective of management of supply chain activities is to maximize customer value and achieve a sustainable competitive advantage



Supply chain management

In other words, supply chain management is about coordinating five key activities: plan, source, make, deliver, and return

The goal is to make these processes as smooth as possible, with short lead times, reduced cost of inventory, reduced total costs for the supply chain, and happy customers.



Supply chain management

Plan: Every company needs a strategy on how to manage the resources in order to achieve their customers demand for their products and services. The supply chain management is developing a set of metric to monitor the supply chain so that it can deliver high qualities and values to customers.

Source: To create their products, companies need to be very careful when choosing suppliers to deliver their goods and services needed. The managers need to develop a set pricing and delivery system in the supply chain. They can also put processes for managing their goods and goods inventory, for example; receiving shipments.

Make: In manufacturing the supply chain manager should always schedule the activities that are needed for the production, packaging, testing and preparation for delivery. The most metric-intensive portion of the supply chain, production output and measure levels.

Deliver: This part is mainly referred to as logistics by the supply chain management. In this case companies coordinate receipts of orders, pick carriers to get products to customers and develop a network of warehouses.

Return: In many companies this is usually where the problem is – in the supply chain. The planners should create a flexible and responsible network for receiving a flaw and excess products sent back to them (from customers).

Does supply chain management matter?

- Having the right product, in the right place, at the right time, is necessary for a company to compete in such volatile market place.
  - ✓ For example, AMR (2008) reported that Nike used improvements to its supply chain to increase operating margins of between 10 and 15% in each of the last four years.

Traditional supply chain-push approach

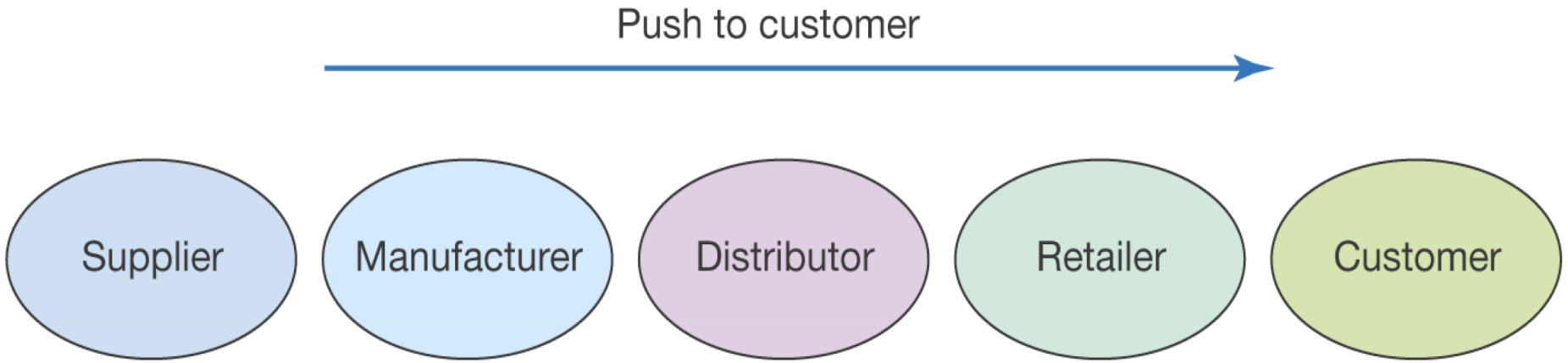
- Push supply chain: A supply chain that emphasizes distribution of a product to passive customers.
- It involves planning production based on a required schedule in advance of customer demand and driven by a forecast.
- Companies forecast to feel confident that the goods they produce will both find willing buyers and not run out unexpectedly soon
- No matter how sophisticated its algorithm, a forecast is only a guess
- Wrong guesses can result in: high carrying costs, discounting, missed sales due to shortages, weak customer loyalty, high debt loads, inventory disposals, emergency shipments, rescheduled production and attenuated profits.

- Production Approximation
- Anticipated Usage's
- Large Lots
- High Inventories
- Waste
- Management byFirefighting
- Poor Communication

PUSH APPROACH

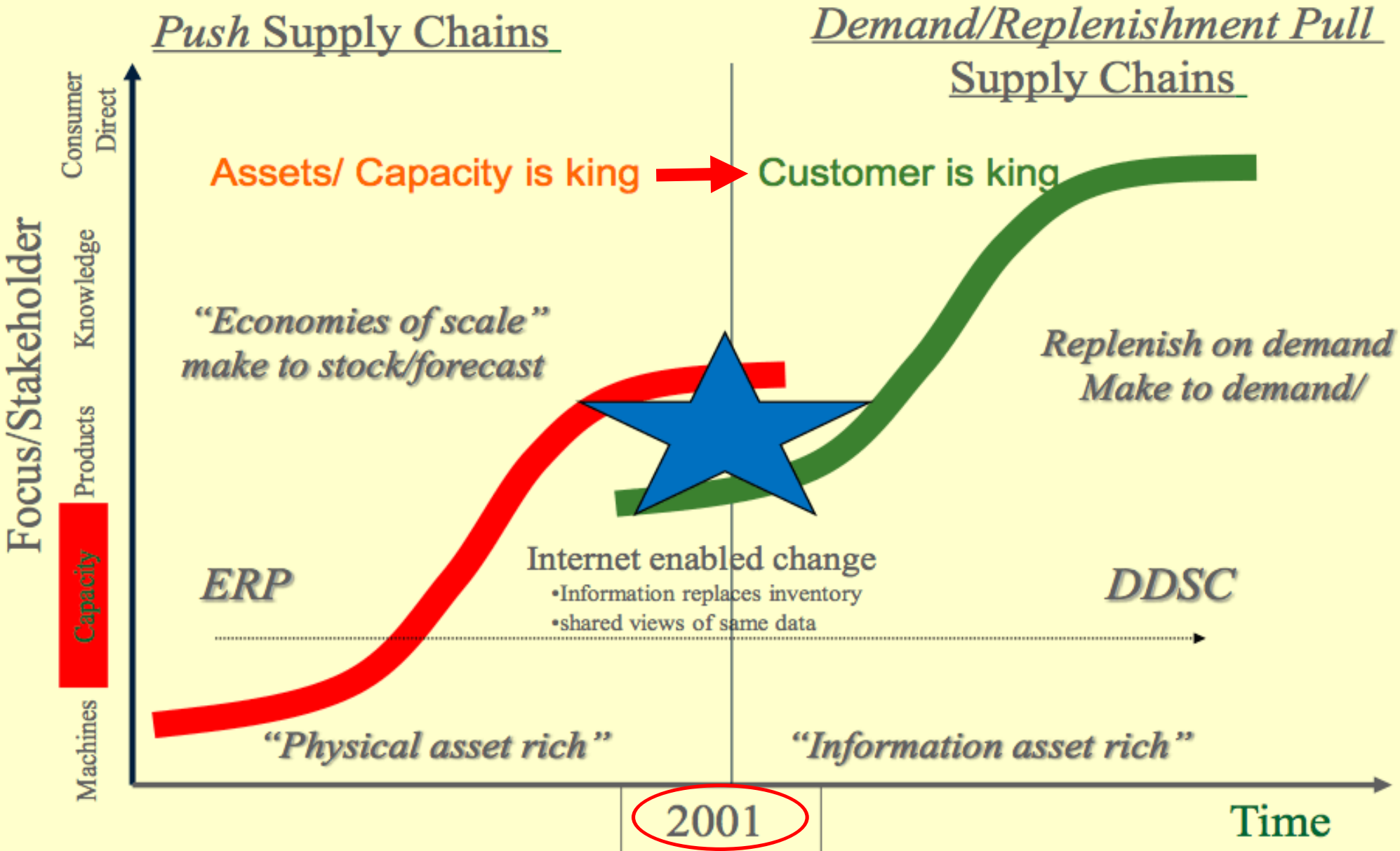
"You can have any color you want, as long as it's black."—Henry Ford [2000x1473] [OC]

Push approach to supply chain management



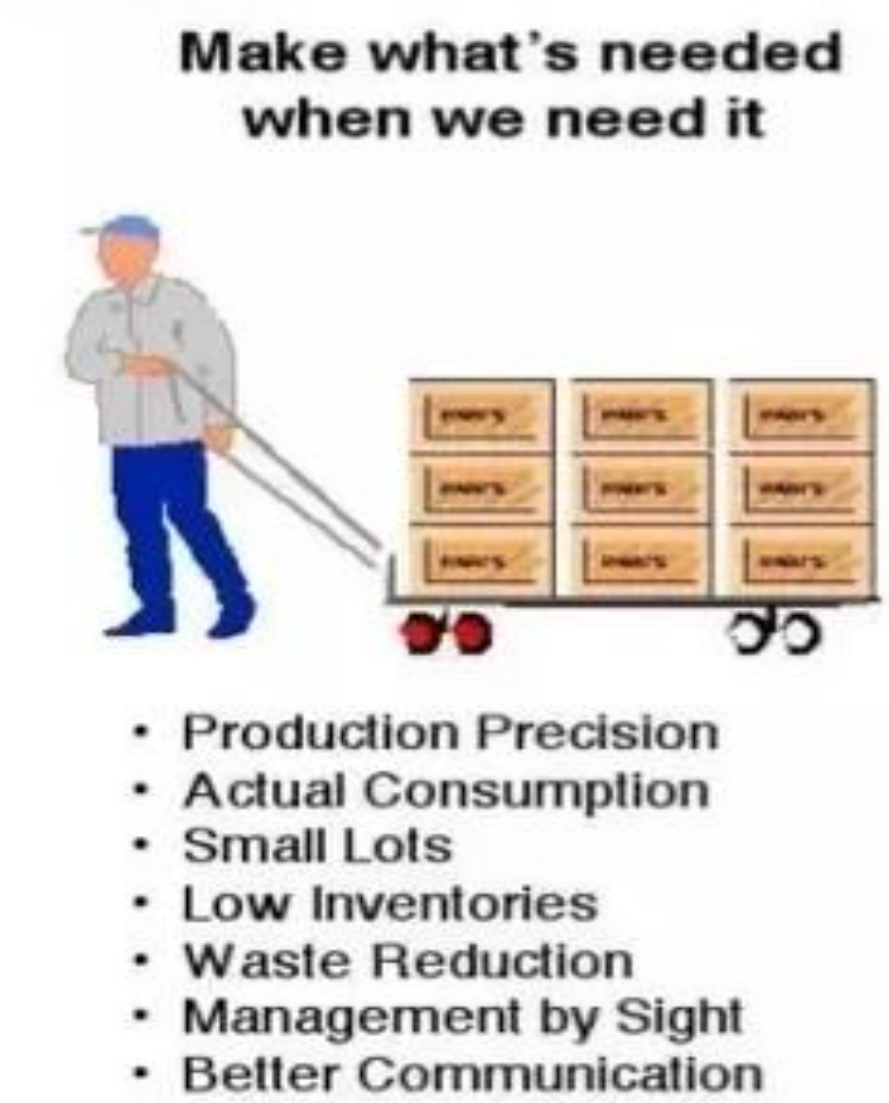
Typical aim:	Optimise the production process for cost and efficiency.
Typical characteristics:	Manufacturer-led new product development, poor data integration through limited use of technology, long cycle and response times, and high inventory levels.
Use of IS:	Independent data management by supply chain members. Limited use of EDI.

Leading Manufacturers Move From Push To Pull……

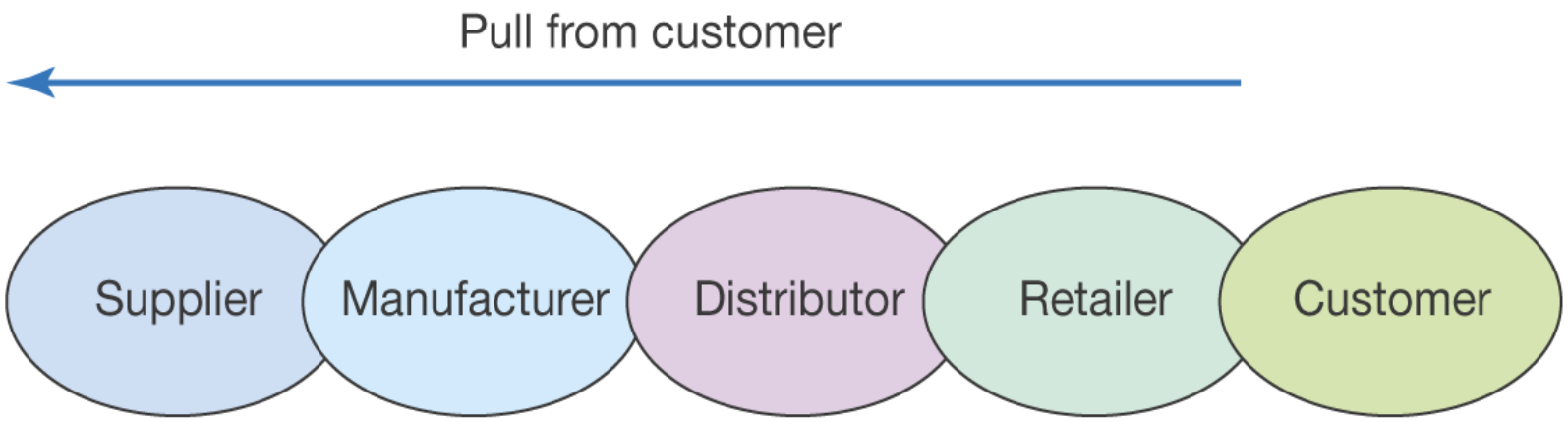


A change in supply chain thinking

- A change in supply chain thinking is the move from push models of selling to pull models or to combined push–pull approaches.
- Pull supply chain: An emphasis on using the supply chain to deliver value to customers who are actively involved in product and service specification.
- In a Pull system, procurement, production and distribution are demand-driven rather than by a forecast.
- A customer purchase initiates real-time information flows through the supply chain that consequently causes movement of product through the network



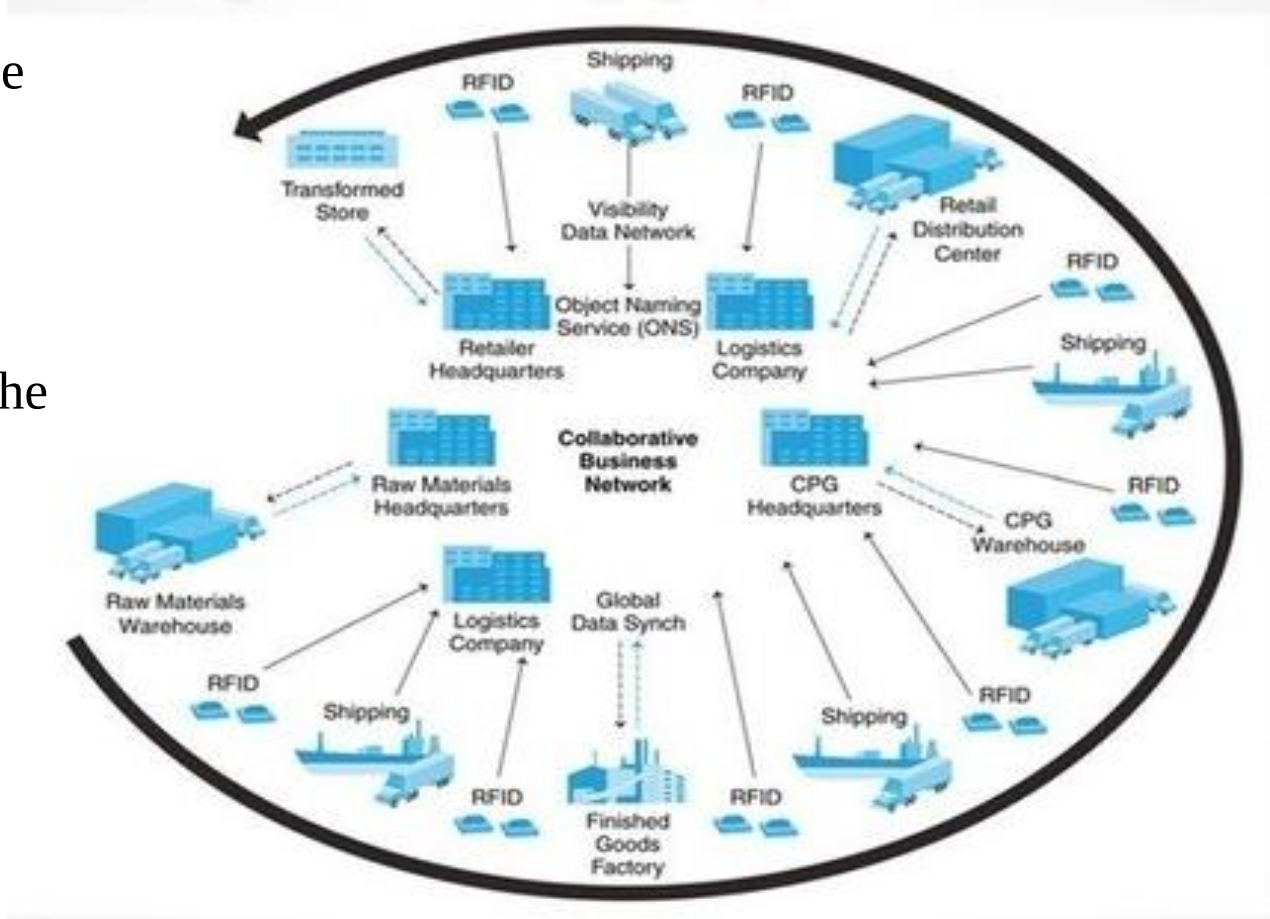
Pull approach to supply chain management



Typical aim:	Enhance product and service quality.
Typical characteristics:	Market research driven, technology used to achieve research and data integration, short cycle and response times, low inventory levels.
Use of IS:	Integrated internal systems, information sharing between supply chain members. Extensive use of EDI and e-commerce, often through B2B exchanges and intermediaries.

Digital business technologies and SCM

- Digital business technologies are vital to SCM since they can enhance the flow of information between actors in supply chains
- The main strategic drive of enhancing the supply chain is to provide a superior value proposition to the customer
- Within the retail and packaged consumer goods market efficient consumer response (ECR) is a key success factor

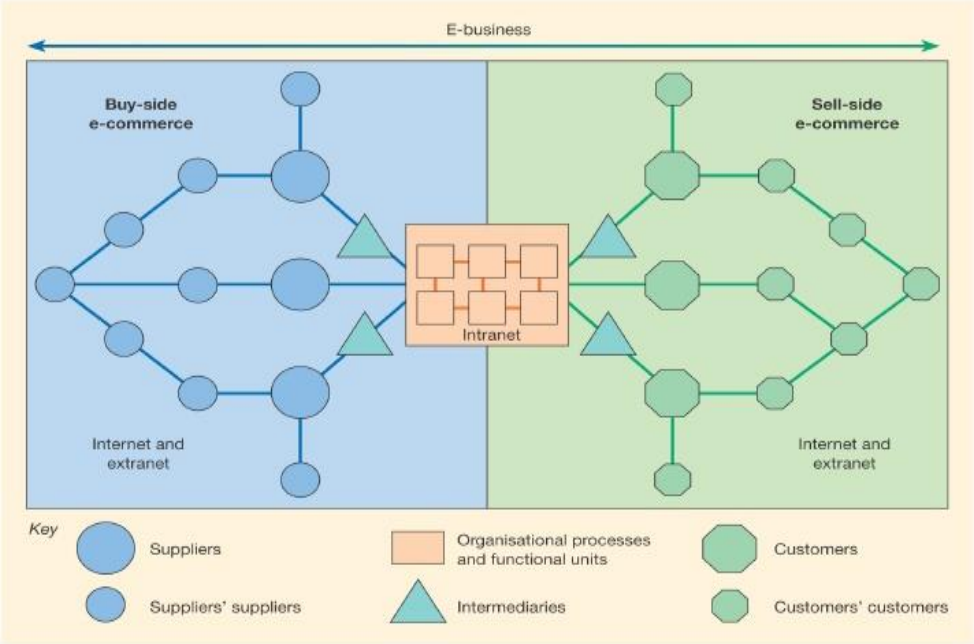


Digital business technologies and SCM

- Supply chain management can be enhanced through buy-side e-commerce, internal communications, relationships with partners and sell-side e-commerce

- Digital business technologies enable information flows to be redefined to facilitate the sharing of information between partners, often at lower costs than were previously possible

E-business and e-commerce



The distinction between buy-side and sell-side e-commerce

Impact of digital technologies on SCM

1. Supply Chain Integration

- This refers to a close alignment and coordination within a supply chain, often with the use of shared management information systems.

- A fully integrated supply chain entails both internal and external integration
  - ✓ Internal Supply Chain Integration: each department is now connected via the same IT infrastructure to increase the efficiency

  - ✓ External Supply Chain Integration: each company in the same supply chain joins hands and work together to achieve the same goal to satisfy customer's requirements

- Digital technologies enable integration across areas of a company and integration of supply chain partners

Integrating company systems with supplier systems

- The cost and cycle-time benefits that a company can achieve through linking its systems with those of its suppliers are significant
- However, if integrating systems within a company is difficult, then linking with other companies' systems is more so.
- This happens since suppliers will use different types of systems and different models for integration.

Benefits of Integration

Flexibility

- Tight supply chain integration gives management operational flexibility to respond rapidly to external events, such as the actions of competitors and changes in customer demand.

- Companies can gather intelligence through their supply chains, which allows them to be generally aware of what their competitors are planning months in advance.

- For example, if a competitor launches a new product, an electronics manufacturer could leverage its integrated supply chain to source the parts, activate a marketing plan and rush a prototype from the design stage to the launch stage in a few weeks.

Benefits of Integration

Improvement of inventory Management

- Integrated supply chains improve inventory management, which means fewer overstocked and understocked conditions.

- Overstocking may result in higher storage costs and product obsolescence, while understocking could mean losing customers to competitors.

- Tight integration means that retailers can quickly adjust their inventory orders weeks or months in advance of anticipated changes in customer demand to ensure that the right amount of stock is on hand.

- Speed is essential in global supply chains because raw materials and finished goods are often transported over long distances. Tightly integrated supply chains also facilitate just-in-time manufacturing, in which companies assemble and manufacture products as the orders come in.

Benefits of Integration

Considerations

- Tightly integrated supply chains can serve as early warning systems.

- For example, if a supplier is experiencing cash flow problems, customers will find out quickly and they can start making alternative arrangements.

- Some customers may step in and loan the supplier some working capital so that they can continue operating.

Impact of digital technologies on SCM

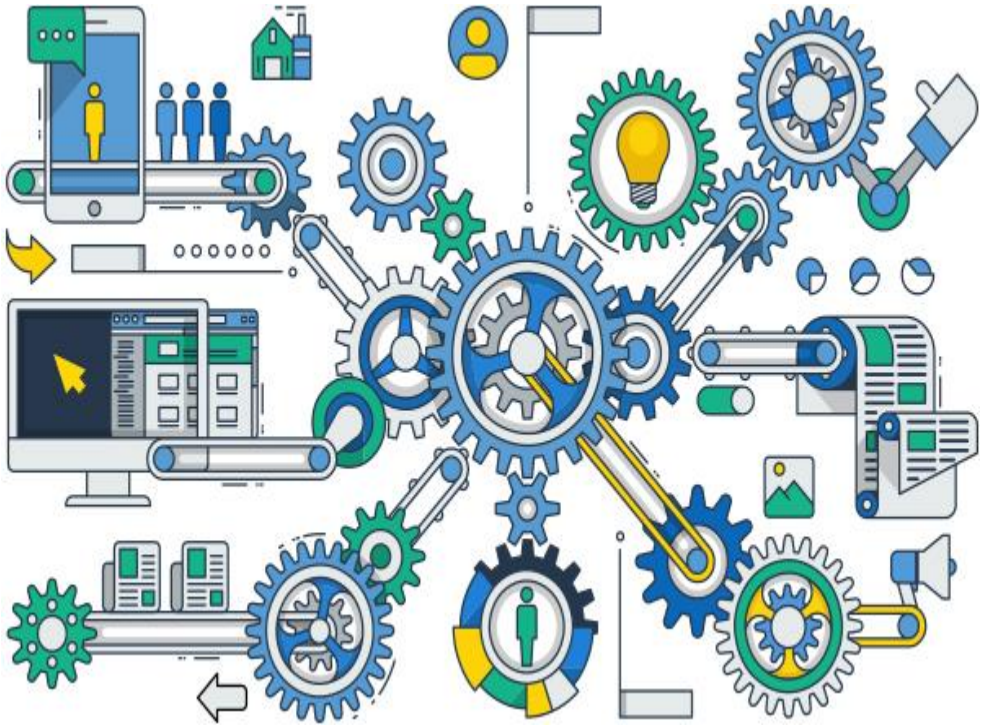
2. Supply chain automation

- Data entry automation: Data from one source is entered into another system without human intervention. The benefits to the business here are speed, accuracy and reduction of headcount or the ability to grow without recruiting.

- Business Process automation: This type is more complex and is rules based: if A happens do B, else do C. For businesses, this is where breakthroughs are made. Results of this kind of automation can be from improved customer service to accelerated product launch

- For example, through robotization, you can seamlessly connect and automate sales, forecasting, replenishment, supply, planning, procurement, manufacturing and distribution activities.

- Automation and intelligent business processes result in responsive and agile supply chains. Responsiveness, speed of innovation and time to market are the goals of today's successful organization.



Impact of digital technologies on SCM

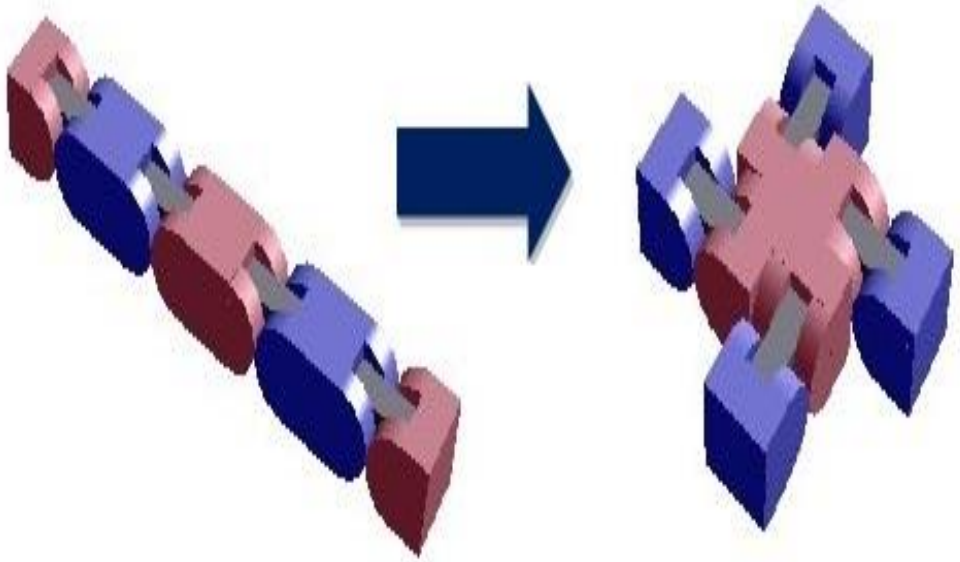
3. Supply chain reconfiguration

- Supply chain reconfiguration means changing of the structure of a supply chain

- Digital technologies enable companies to reconfigure their supply chains to their advantage.

- Examples include:
  - ✓ Use of E-platforms for direct supplier selection and transactions

  - ✓ Use of app-based E-platforms for express and parcel courier deliveries



-Continued emergence of drone use will be seen in the coming years.

-Drones offer a sheer competitive advantage in terms of automation, and the lack of requirement to abide by conventional working rights

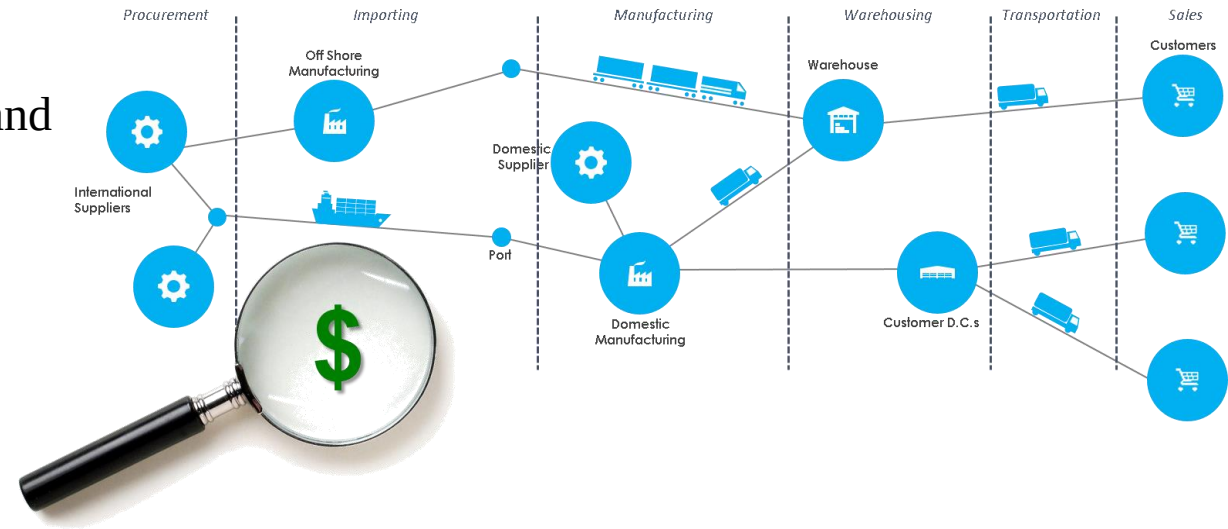
Impact of digital technologies on SCM

4. Supply chain visibility

- Digital technologies enable supply chain visibility (SCV), that is, the ability of parts, components or products in transit to be tracked from the manufacturer to their final destination.

- The goal of SCV is to improve and strengthen the supply chain by making data readily available to all stakeholders, including the customer.

- End-to-end supply chain visibility empowers supply chain and logistics managers to make educated decisions

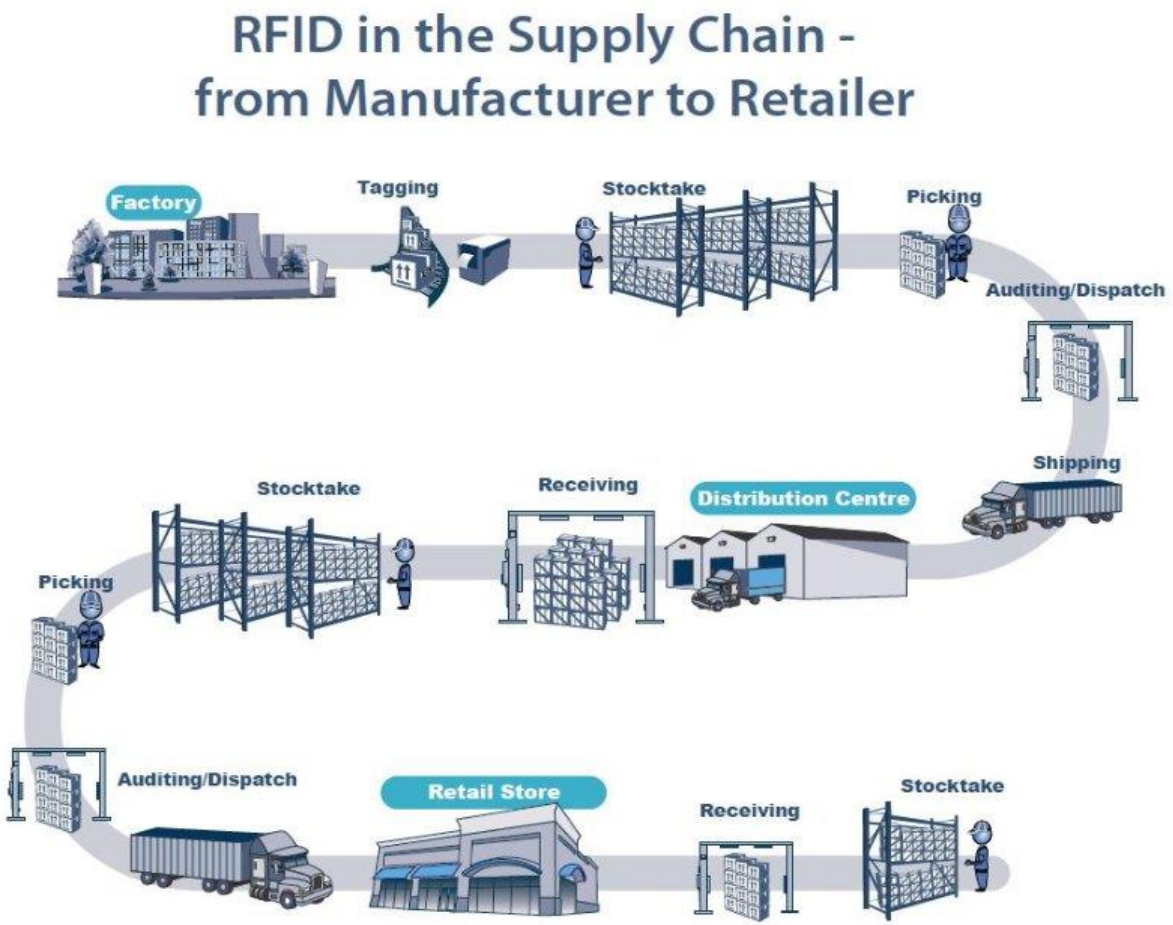


RFID Enabled Supply Chain Visibility

- RFID technology provides real-time, up-to-date information across the entire supply chain delivering insight into a fragmented and sometimes chaotic distribution environment.

- The visibility enabled with a holistic RFID strategy assists management at various stages of the supply chain from the source, to the logistics company, through distribution and finally the end customer.

- Many transportation and logistics companies are using RFID today to achieve near 100% shipping, receiving, and order accuracy; 99.5% inventory accuracy; 30% faster order processing and 30% reduction in labour costs.



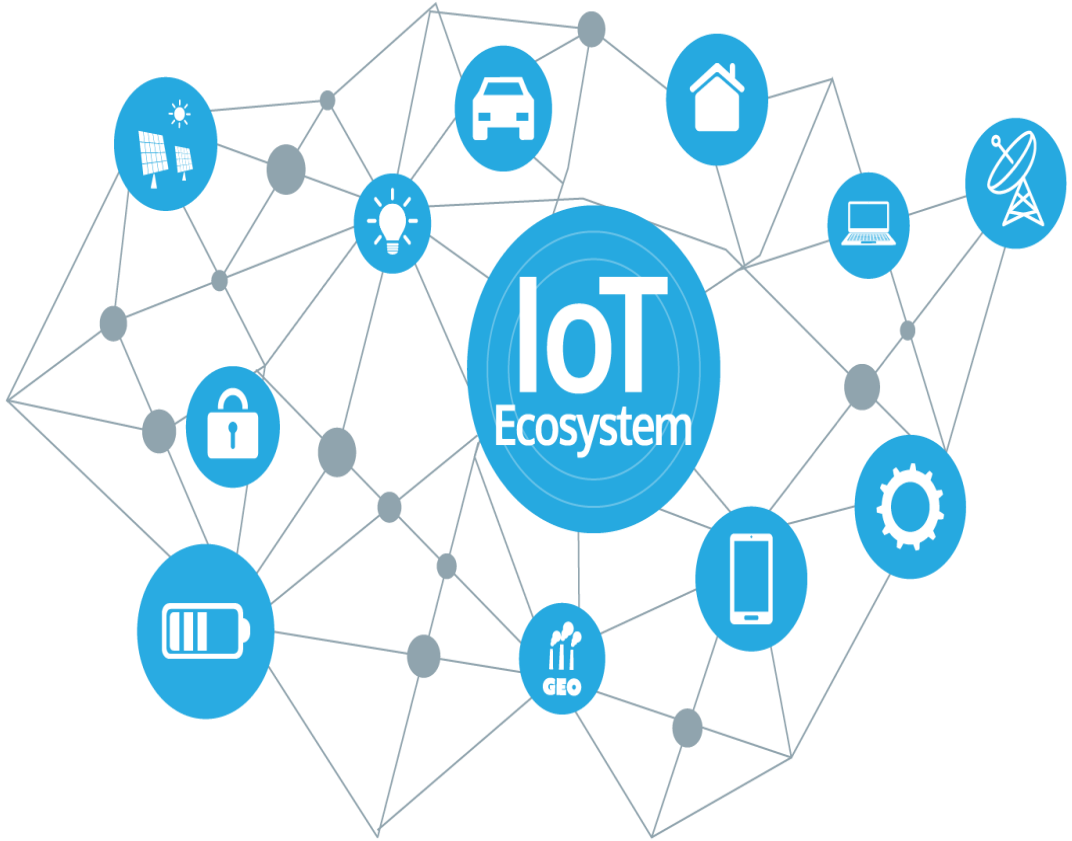
IoT Enabled Supply Chain Visibility

- While the need for better supply chain visibility has been around for as long as there have been supply chains, the technological innovation that could serve as the perfect enabler of this supply chain evolution was missing.

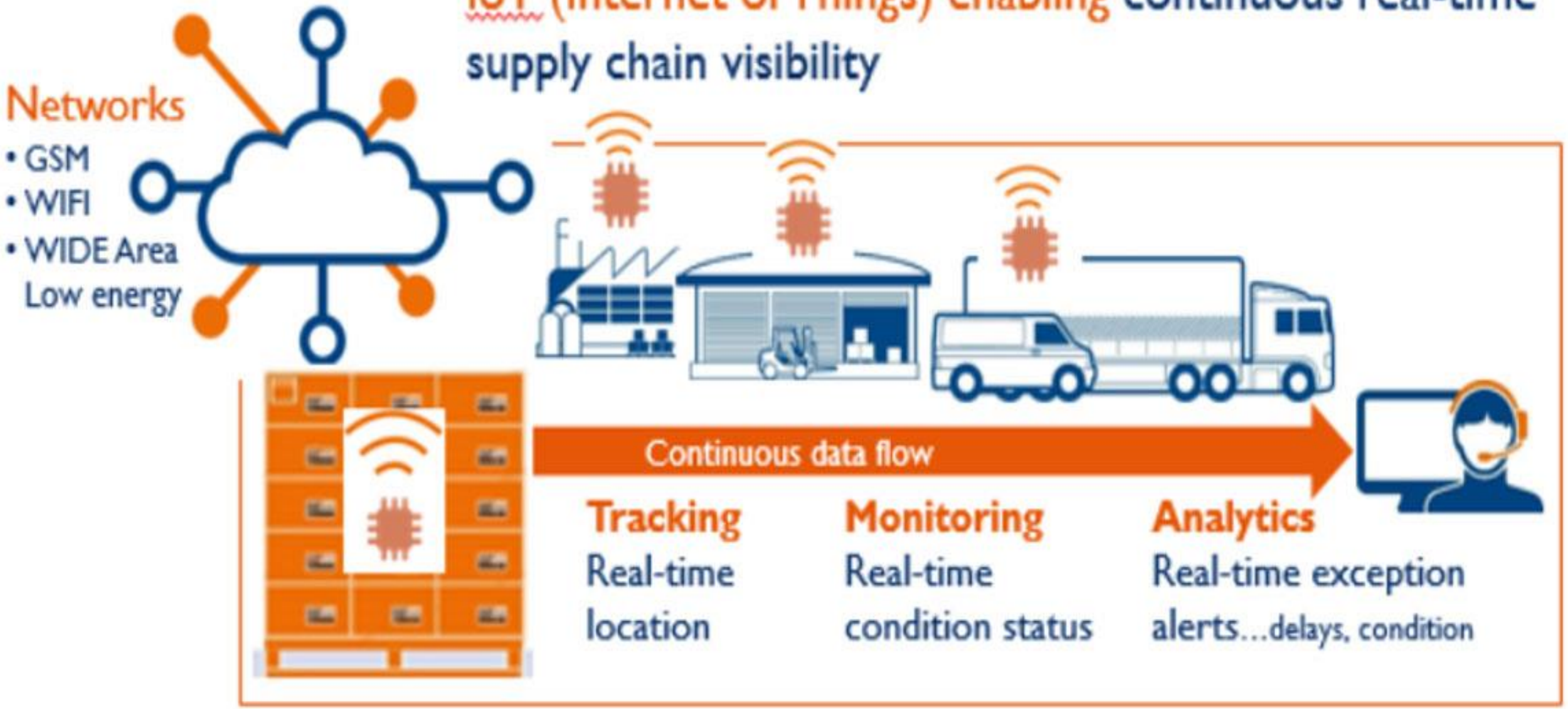
- Thanks to the ever increasing availability of IoT technologies, supply chain visibility can already be achieved today.

- The power of IoT lies in intelligently connecting people, processes, data and things via devices and sensors creating a networked ecosystem of things continuously measuring, collecting and exchanging 'live' data.

- IoT enabled supply chain analytics dashboards provide opportunities for supply chain leaders to have better access to real-time data and transform today's outdated supply chain structures and create the supply chains of the future that are hyperconnected, innovative, transparent and intelligent.



IoT (Internet of Things) enabling continuous real-time supply chain visibility



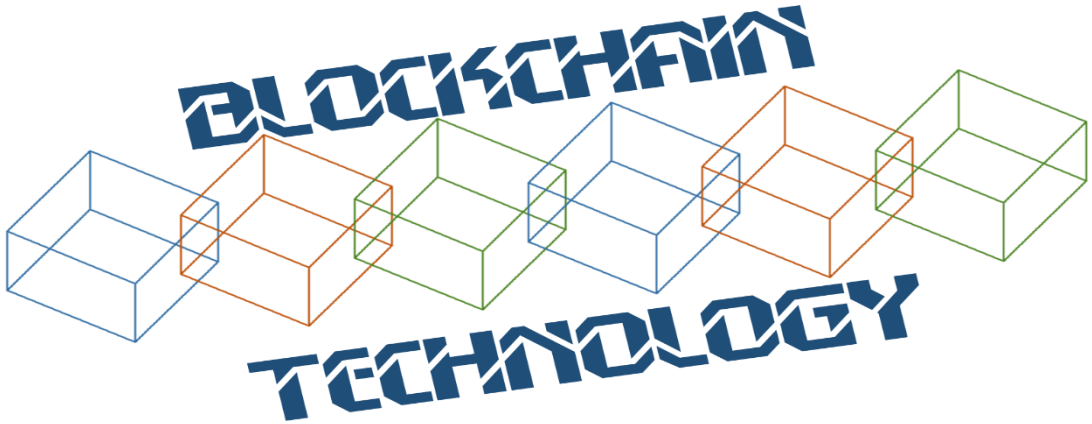
Impact of digital technologies on SCM

5. Provenance of products

- Provenance is concerned with making supply chains more transparent by authenticating that a product is what it is supposed to be, and came from where it was supposed to come from.

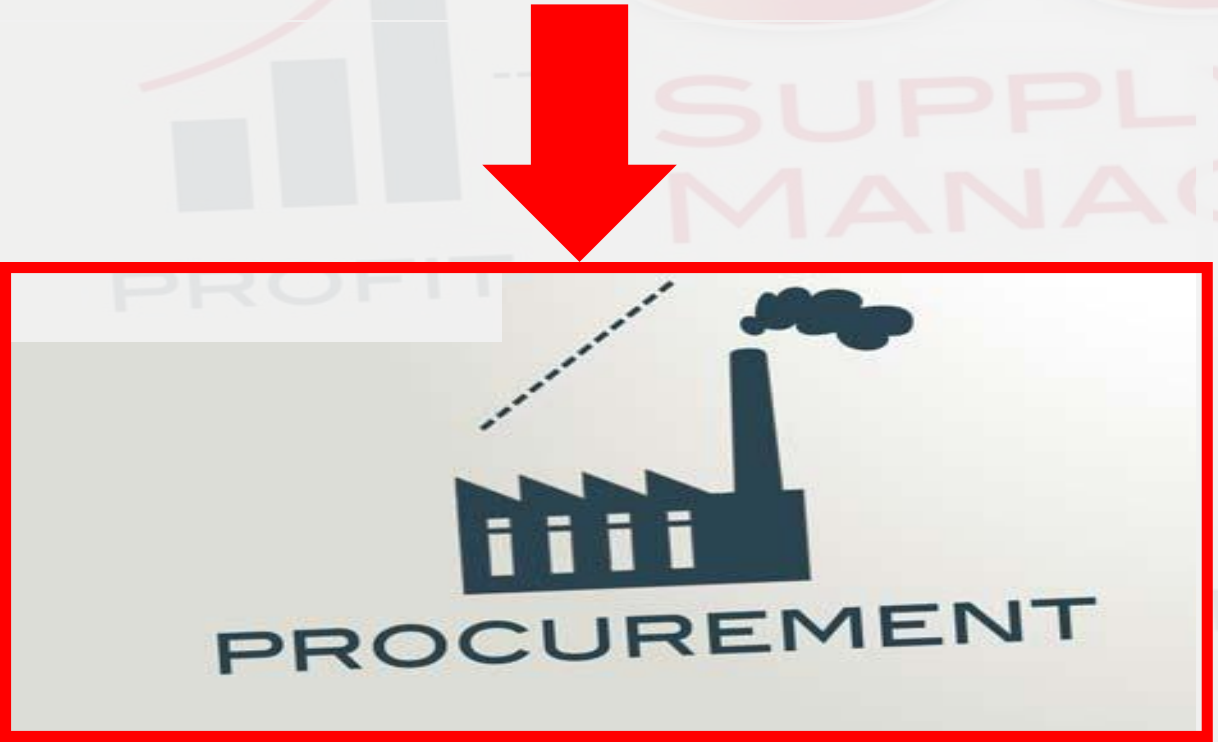
- Blockchain technology enables establishment of provenance of products by making the whole business footprint is auditable.

- Many larger producers do not want to reveal provenance of their goods for fear of losing a competitive advantage. Blockchain allows information to be transferred in a trustworthy and anonymous way.



Recommended: IBM and Maersk demo: Cross-border supply chain solution on blockchain

https://www.youtube.com/watch?v=tdhpYQCWnCw


PROCUREMENT

Procurement

- Procurement “is the process of getting the goods and/or services your company needs to fulfill its business model.

- It includes the activities involved in establishing fundamental requirements, sourcing activities such as market research and vendor evaluation, negotiation of contracts and management of supplier relationships

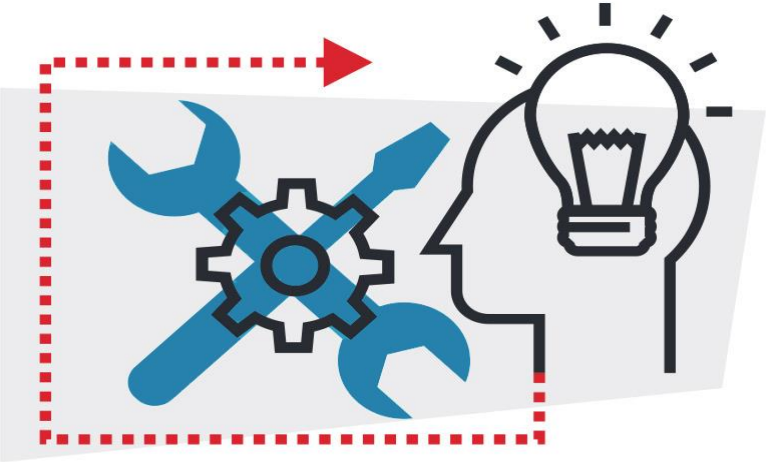
- To make a profit, the cost of procuring your goods must be less than the amount you can sell the goods for, minus whatever costs are associated with processing and selling them.”

Categories of procurement

Depending on what is bought there are two broad categories of procurement:

1. Production-related procurement (Direct procurement)
Direct procurement is the act of acquiring raw materials and goods for production. These purchases are generally done in large quantities, acquired from a pool of suppliers at the best possible cost, quality and reliability. These purchases are made frequently and are necessary for key business practices, such as a baker acquiring flour to produce bread. If direct procurement stops functioning or encounters problems, companies are no longer able to manufacture their product and create revenue.

2. Operating or nonproduction (Indirect Procurement)
Indirect procurement is the act of purchasing services or supplies required to keep the day to day business alive. This includes procurement of things such as office supplies, furniture, information systems and MRO goods. Without indirect procurement functions, businesses wouldn't be able to operate in an effective fashion.



Procurement

- Traditionally procurement has been an anonymous function— merely as a cost center with mostly clerical responsibilities

- However, for the typical company, procurement costs can represent anywhere from 50% to 75% of annual revenues, so even small reductions in that cost base can have a big impact.

- Study by the Aberdeen Group found that for a typical enterprise, it would take a $5 increase in sales to equal the impact of a $1 reduction in procurement costs

- For that reason procurement function has evolved throughout the past decades from a clerical, order-taking role to a strategic role.

Leverage effect of Procurement

The changing role of procurement

- There has been a shift in perception of procurement as a mere administrative and transactional role.

- Procurement today increasingly play strategic role, involving strategic partnerships, cooperative alliances and supply network management

- Influential factors driving this change
  - Increased globalisation
  - Technological advances
  - Increased demands by upper management
  - Changing consumer patterns
  - A shift towards outsourcing and
  - a greater awareness of corporate social responsibility

What is e-procurement?

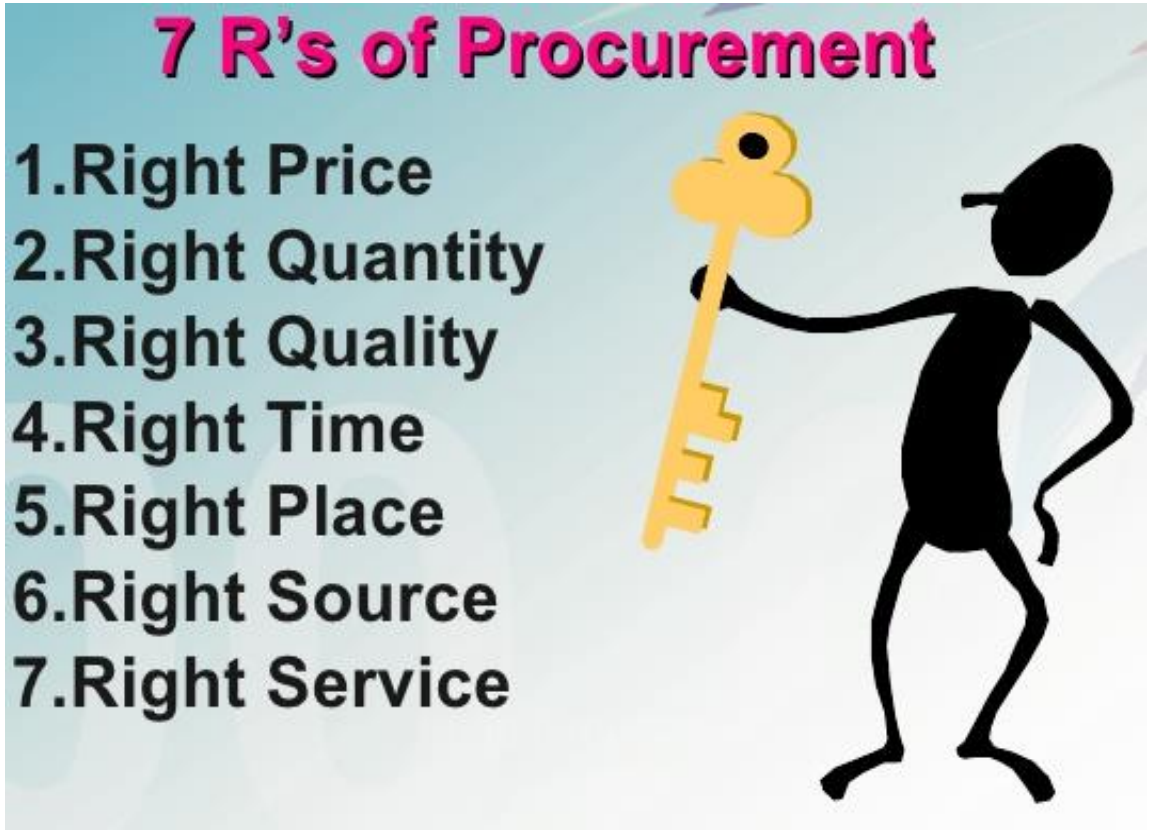
- E-procurement typically refers to online performance of activities involved in the acquisition of goods and services for business purposes. It is done online or over some digital network or platform.

- This is a rather broad description of many transactions that happen based on modern technologies and business and vendor partnerships.

- An e-procurement system can streamline all aspects of the procurement process and help organizations achieve significant savings and other benefits which directly impact profits.

Role of E-procurement

E-procurement should be directed at improving performance for each of the 7 R's of procurement:



Forms of e-procurement

1. E-sourcing

- Finding potential new suppliers using the internet during the information gathering step of the procurement process
- By identifying new suppliers a purchaser can increase the competitiveness in the tactical purchasing process for a particular spend category.
- It is a way of decreasing the supply risk associated with this spend category

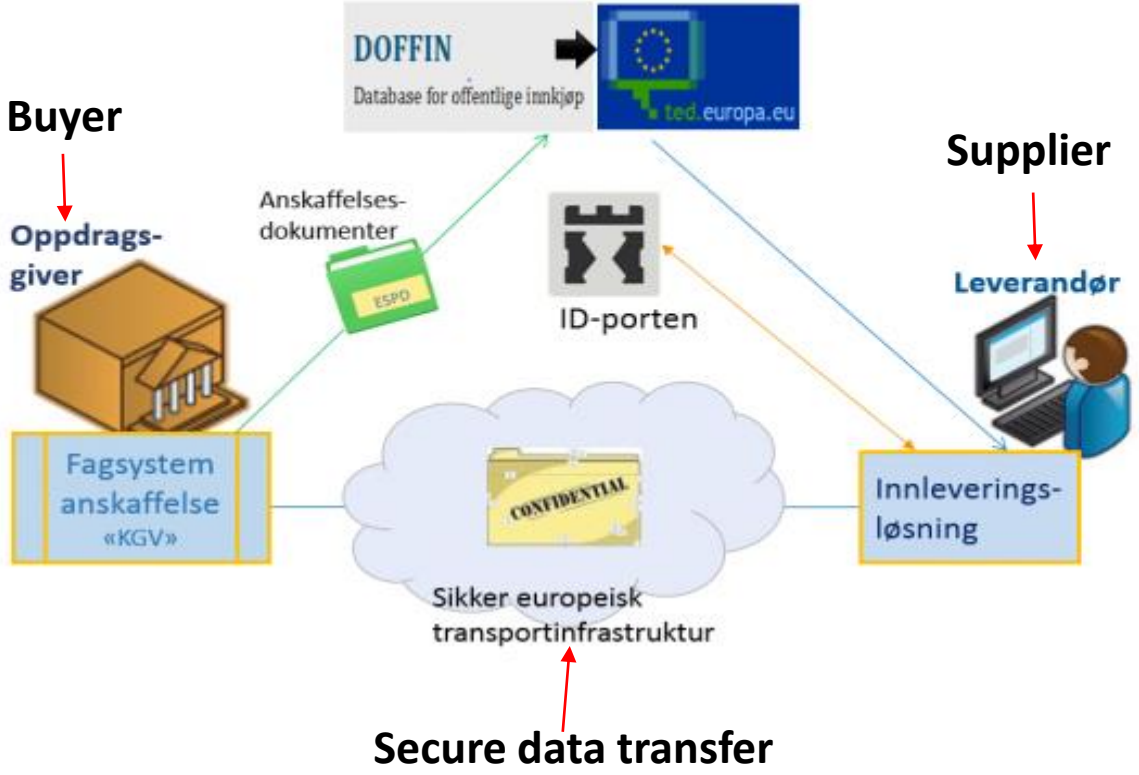
Forms of e-procurement

2. E- tendering

- The process of screening suppliers and sending suppliers requests for information (RFI) or requests for proposal (RFP) and receiving the responses of suppliers back, using Internet technology.

- Usually e-tendering is supported by an e-tendering system. Often the e-tendering system also supports the analysis and assessment of responses.

- E-tendering does not include closing the deal with a supplier. As a matter of fact, e-tendering smoothens a large part of the tactical purchasing process without focusing on the content of that process.



Forms of e-procurement

3. E-informing

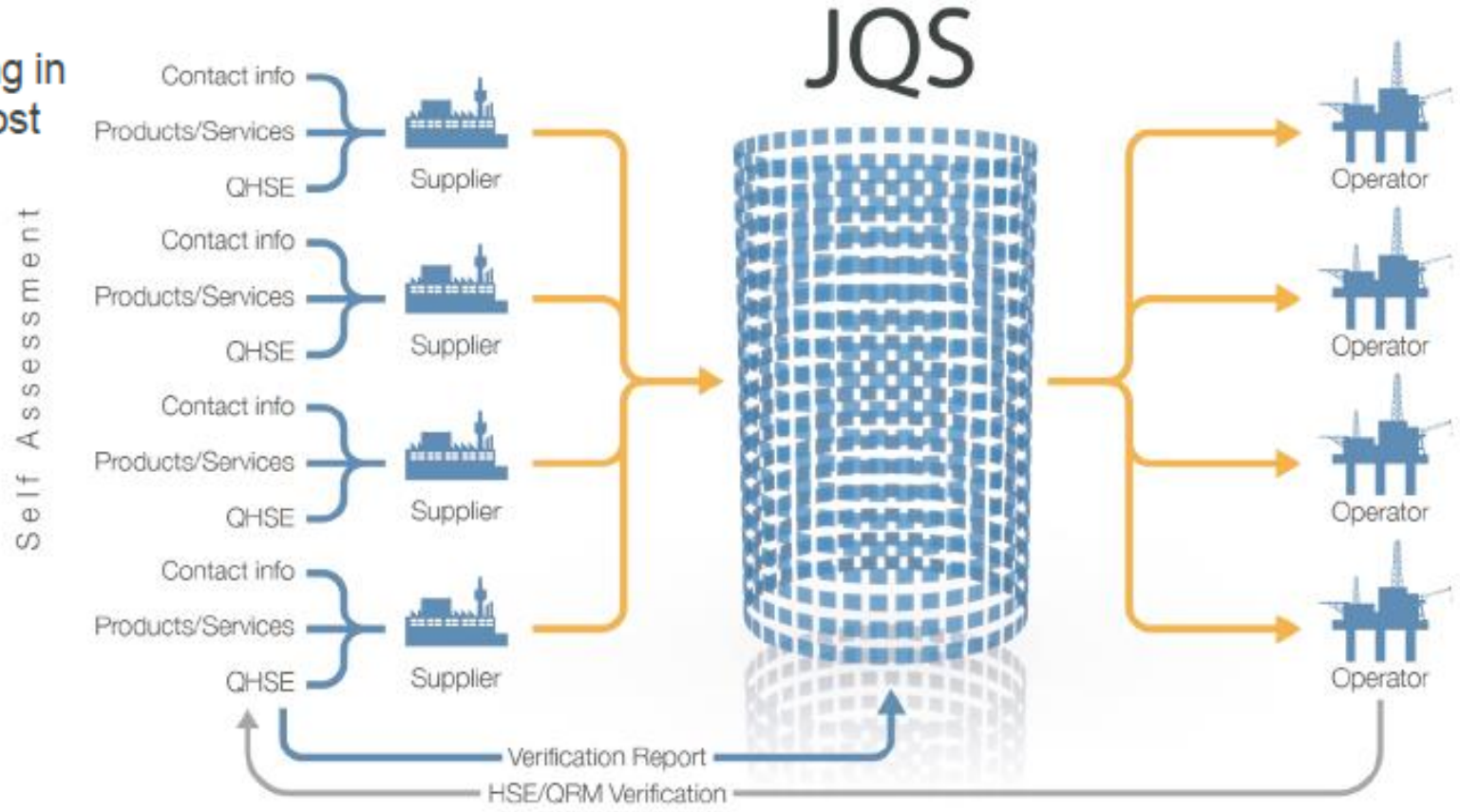
- E-informing is the process of gathering and distributing purchasing information both from and to internal and external parties, using Internet technology.

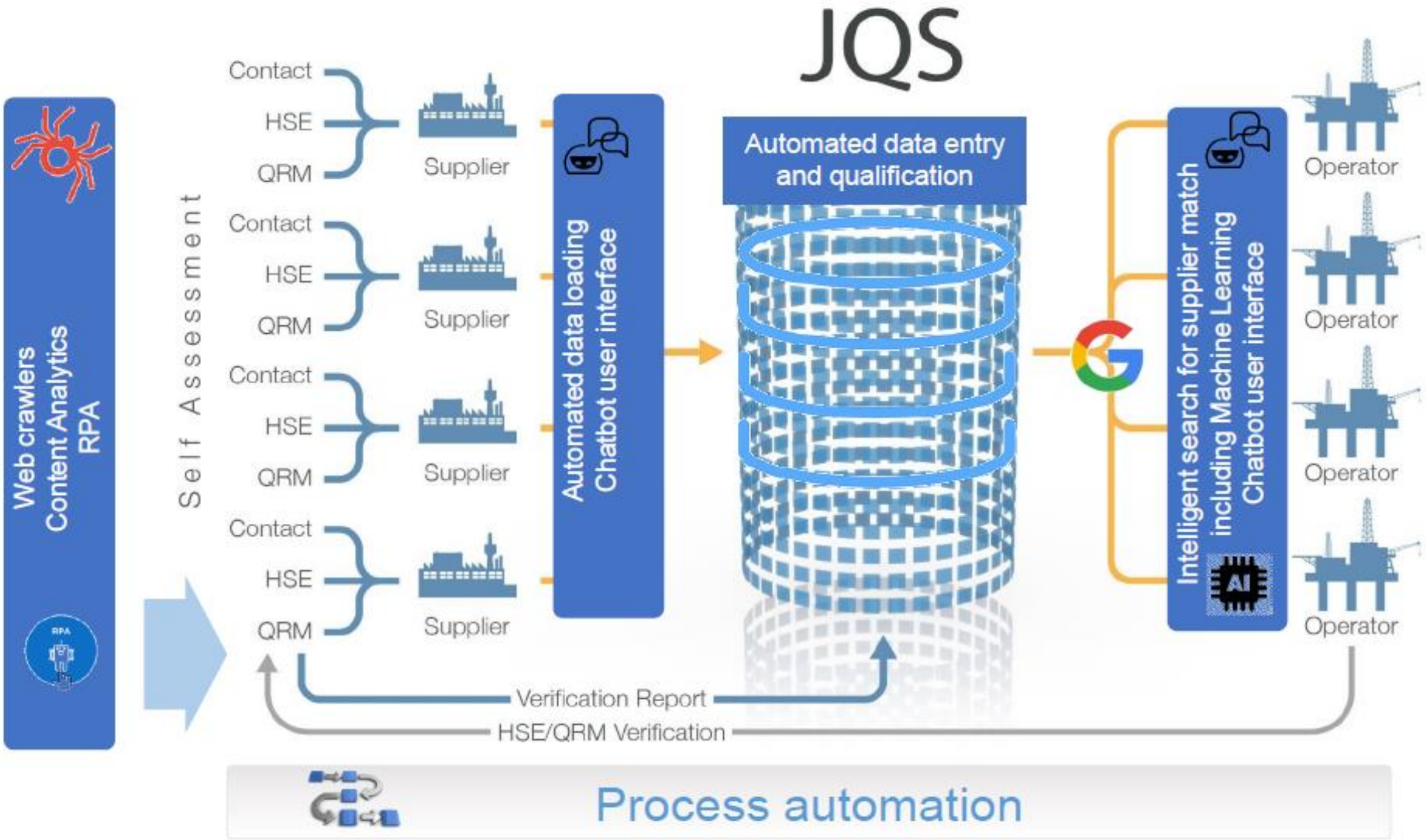
- It is useful for qualification of suppliers. It doesn't involve transactions but instead handles information about the supplier's quality, financial status or delivery capabilities.

- For example, publishing purchasing management information on an extranet that can be accessed by internal clients and suppliers is a way of e-informing

E-informing

JQS is a supplier register and a service for qualification used by purchasers in the Norwegian and Danish oil and gas sector. It manages supplier information and risk in the supply chain, and enables efficient purchasing in accordance with EU regulations, covering most procurement needs




JQS
Web crawlers
Content Analytics
RPA
Self Assessment
Contact
HSE
QRM
Supplier
Automated data loading
Chatbot user interface
Automated data entry
and qualification
Intelligent search for supplier match
including Machine Learning
Chatbot user interface
AI
Operator
Verification Report
HSE/QRM Verification
Process automation

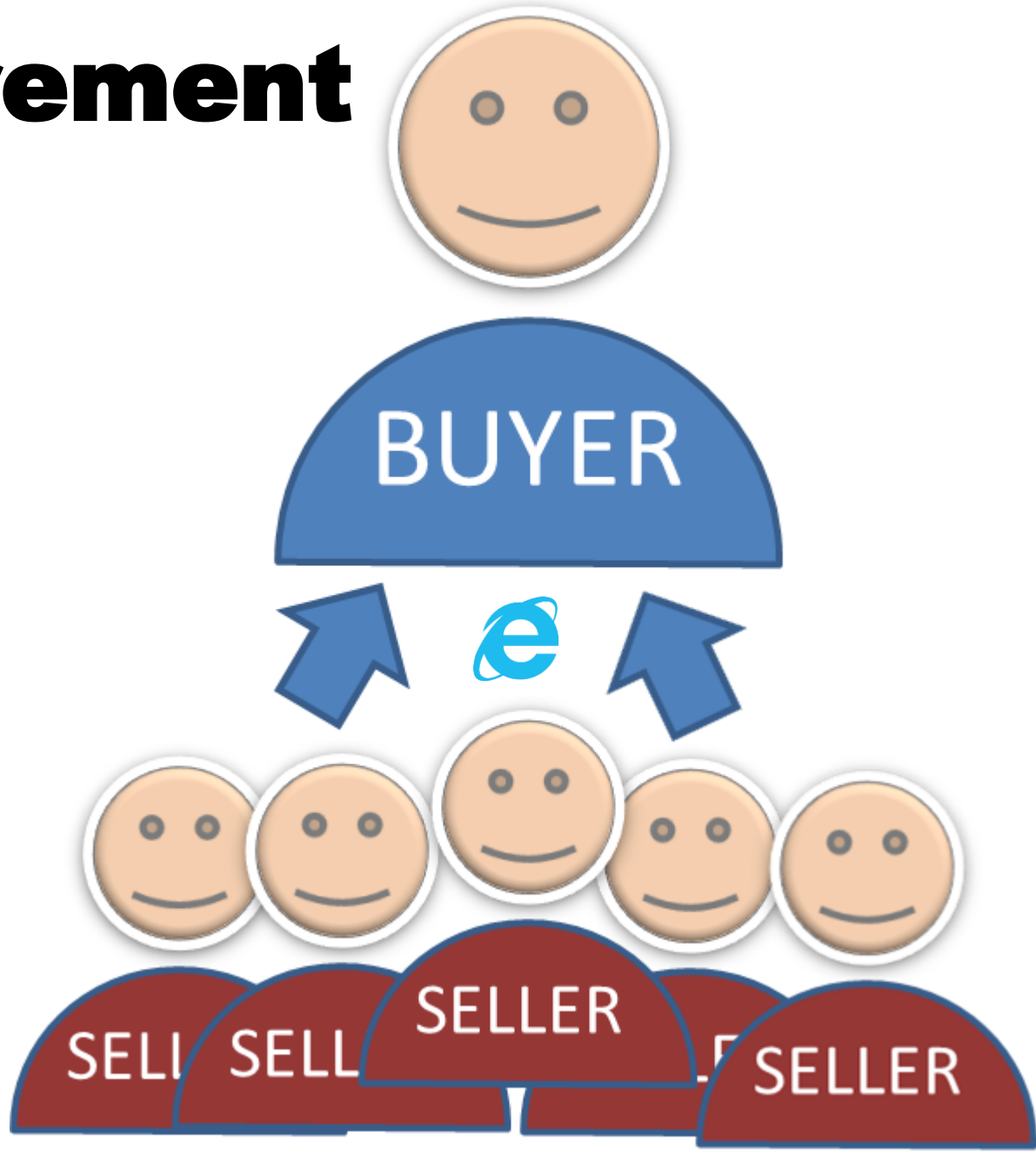
Forms of e-procurement

4. E-reverse auctions

- E-reverse auction is the Internet technology based reverse auction, that is, it enables a buying organisation to buy goods and services needed from a number of (known of unknown) suppliers.

- This way, E-reverse auction enables the purchasing company to buy goods and services that have the lowest price or combination of lowest price and other conditions via internet technology.

- E-reverse auctioning does really close a deal between a buying organization and a supplier, if parties agree on the price.



Example of reverse auction software – ProcurePort

ProcurePort eSourcing OnDemand

Supplier Management

Events | Event Participants | Application Users | Product Catalog | Reports | Global Settings

Dashboard > Events > Auction > Create New

POWERED BY ProcurePort

Auction Setup

1 Basic Info. | 2 Committee | 3 Configuration | 4 Lot & Item Details | 5 Participants | 6 Review & Finalize

Reverse Auction (ID : 2464) : Hudson Bay RFI RFQ - Complex Pricing Submission

Basic Information

* Required Fields

Name	*	Hudson Bay RFI RFQ - Complex Pricing Submission
Time Zone	*	US/Eastern
Currency		$ | USD | US Dollar
Participant Instructions		

Show Active Participants Only | Bid Alarm | Auto Refresh Every : 30 Sec | REFRESH

Note : Non Evaluatory items are appearing with Magenta color and substracted items are appearing with OrangeRed color. Non Active Items are appearing in AliceBlue background.

Rank 1 Participant Lot Total : $ 164.00

3125614M , 1.5mil Napll Gloss36x3000 3CPO — Actions

Starting Bid : $ 278.01 | **Current Best Bid :** $ 60.00 | **Qty :** 23 number
Value Change : $ 218.01 [78.418%] | **Bidding Unit :** 1 number | **Reserve Price :** N/A

Company	Starting Bid	Bidding Date / Time	Bid Amount	Transformed Bid (Rank)	Transformed Value	
Edward Communication Providers	$ 278.01	Sep 26, 2017 10:40:42 AM [US/Eastern]	$ 56.00	$ 60.00 [1]	$ 1,380.00	Actions
Great Network Services	$ 278.01	May 23, 2017 11:37:31 PM [US/Eastern]	$ 76.00	$ 80.00 [2]	$ 80.00	Actions
Dell Connections	$ 278.01	Dec 18, 2015 12:35:51 AM [US/Eastern]	$ 182.00	$ 193.00 [3]	$ 193.00	Actions
Prime Solutions	$ 278.01	Dec 18, 2015 12:20:34 AM [US/Eastern]	$ 260.00	$ 269.00 [4]	$ 269.00	Actions

3125614 , 1.5mil Napll Gloss36x3000 3CPO — Actions

Starting Bid : $ 120.38 | **Current Best Bid :** $ 55.00 | **Qty :** 12 number
Value Change : $ 65.38 [54.311%] | **Bidding Unit :** 1 number | **Reserve Price :** N/A

3125111M , 1.5mil Napll Matte18x3000 3CPO — Actions

Forms of e-procurement

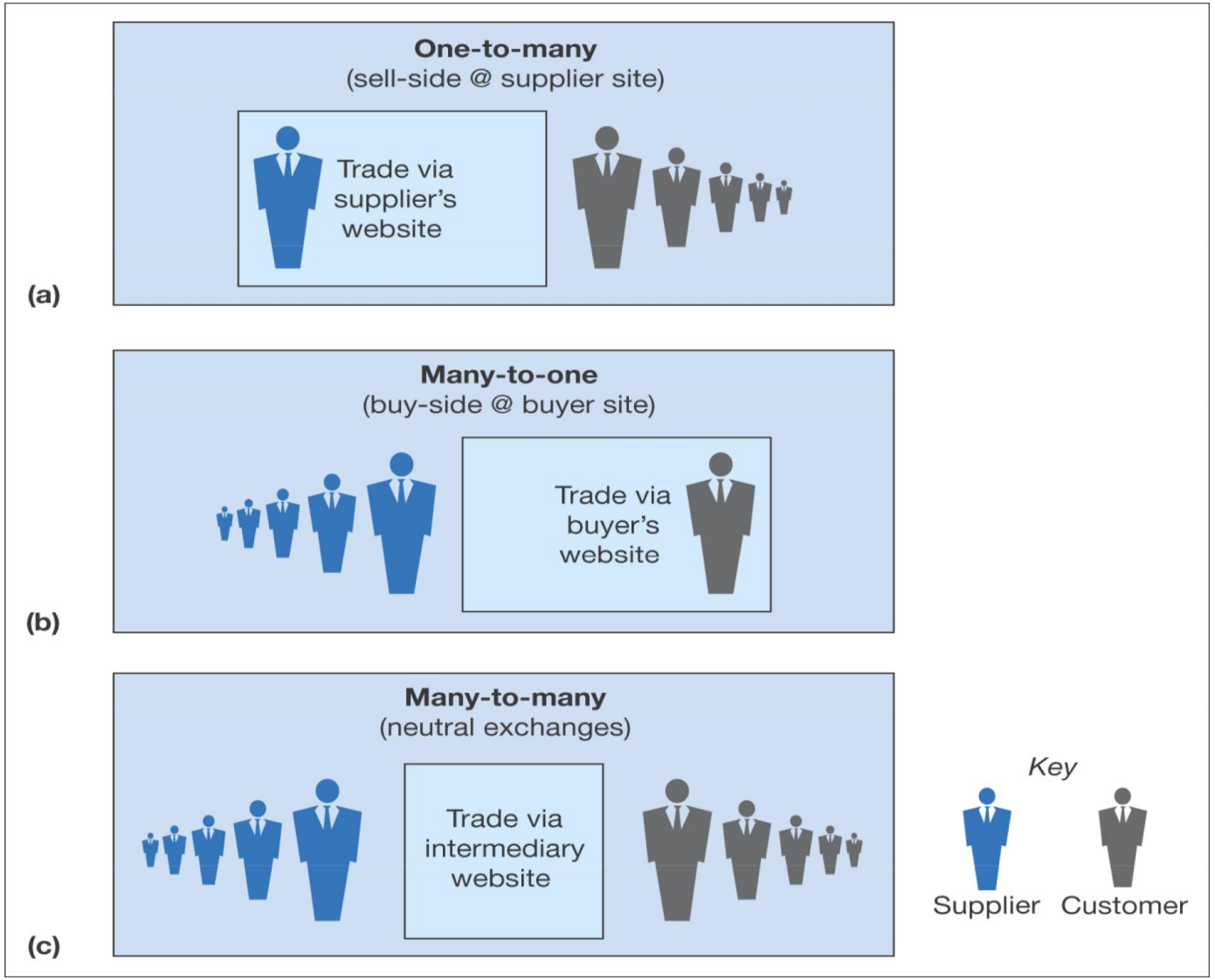
5. E-ordering and 6. web-based ERP

- Both involve the process of creating and approving purchasing requisitions, placing purchase orders as well as receiving goods and services ordered, by using a software system based on Internet technology.

- However, In the case of e-ordering the goods and services ordered are indirect goods and services. The supporting software system (an ordering catalog system) is usually used by all employees of an organisation.

- In the case of web-based ERP the goods and services ordered are production-related. Usually only the employees of the procurement department are using the supporting software system (a web-based ERP-system (Enterprise Resource Planning)).

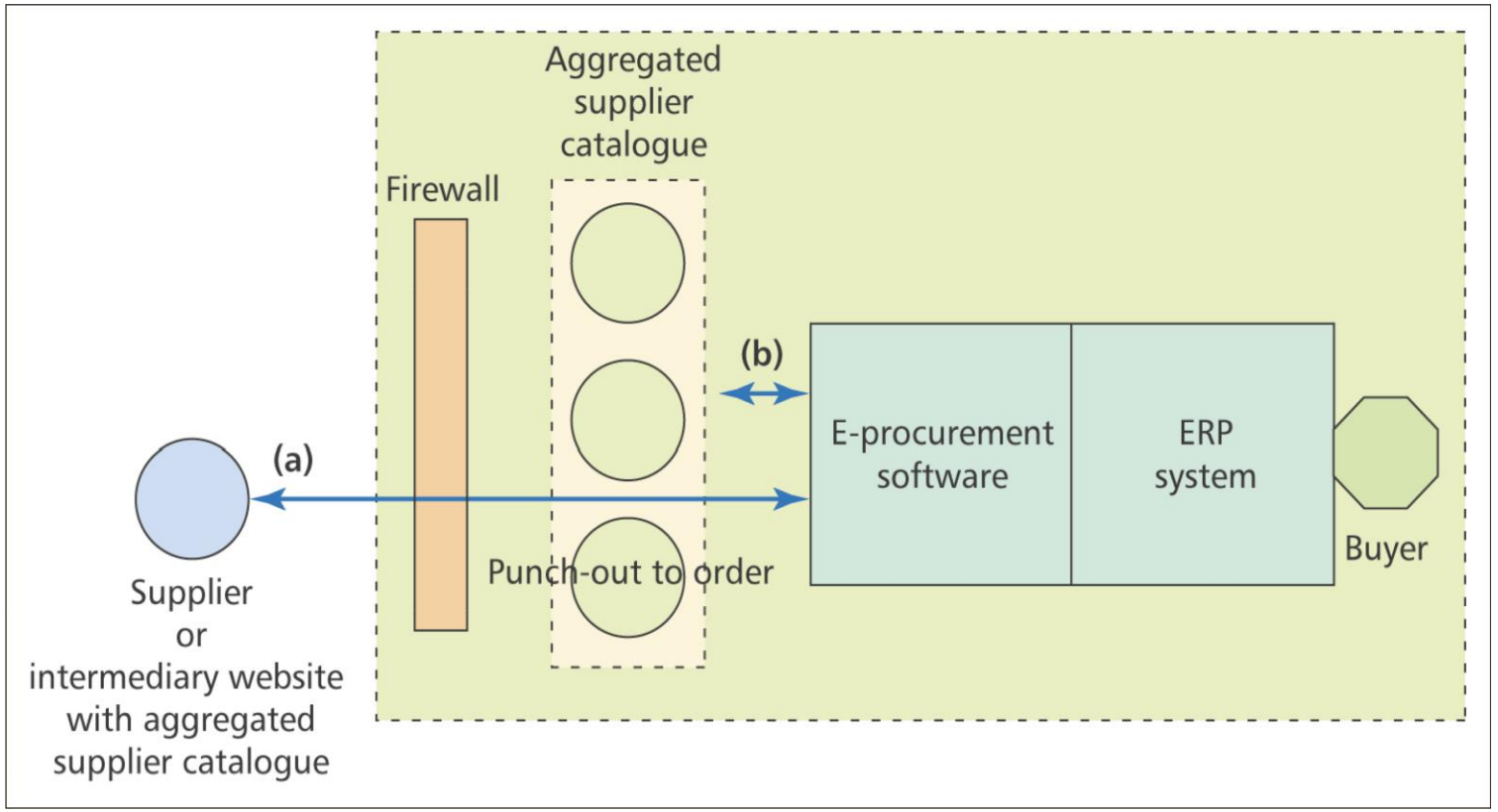
The three main e-procurement model alternatives for buyers



Options for integration of an internal system with external systems

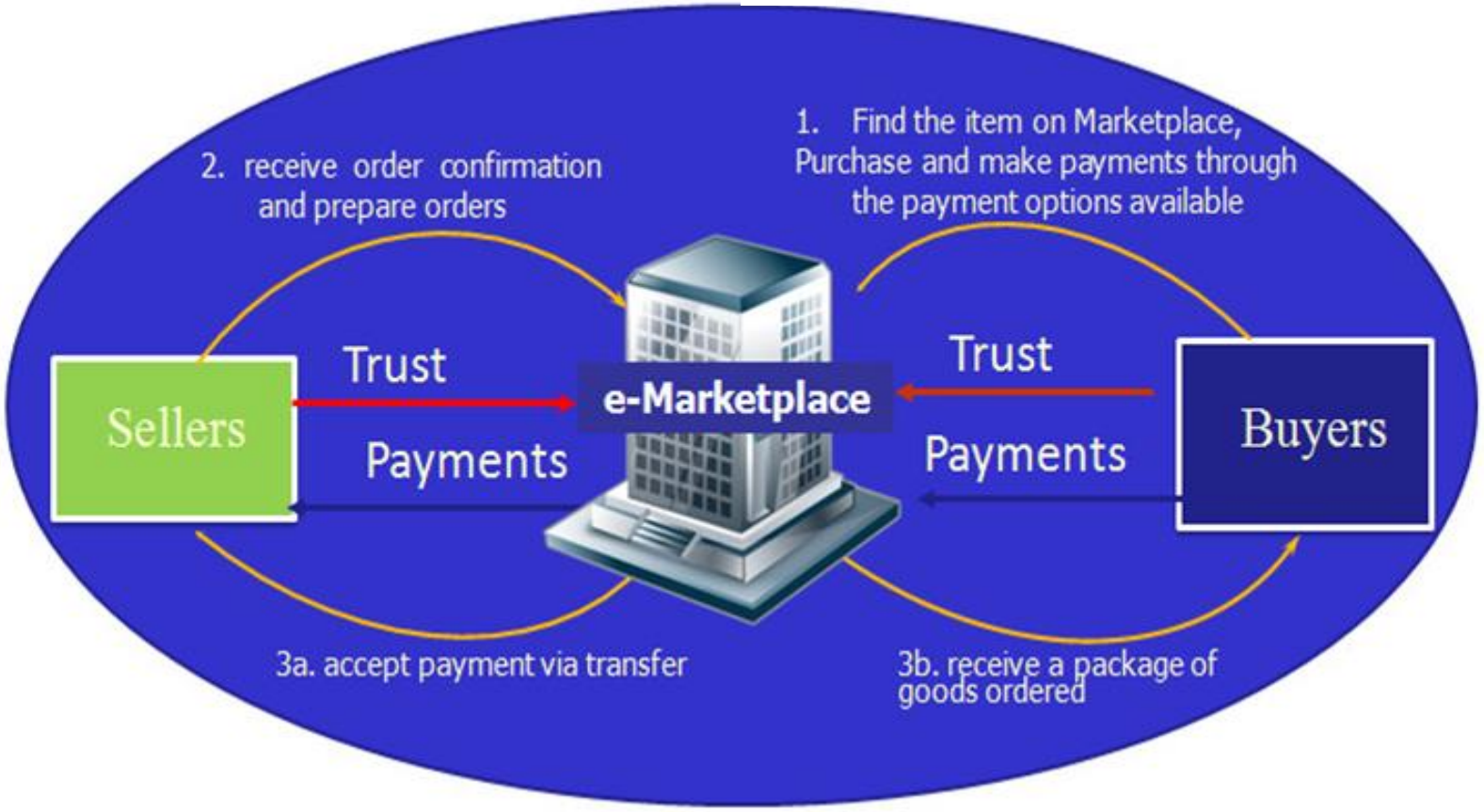
a. Punching out through the firewall to access catalogues either on a supplier site or at an intermediary site.

b. Housing electronic catalogues from different suppliers inside the company and firewall.



B2B electronic marketplaces

- These are virtual locations with facilities to enable trading between buyers and sellers.
- Typically they are intermediaries that are part of the reintermediation phenomenon
- They are independent of buyers and suppliers.



Top 10 B2B marketplaces around the world

https://medium.com/sellergyan/top-10-b2b-marketplaces-around-the-world-884a499ee4f6

OFweek Industrial B2B Marketplace

TRADEKEY Your Key To Global Trade

CONNECTING INDUSTRY ThomasNet

The largest B2B marketplace

EC21 Global Marketing & Consulting

tradeindia.com India's largest B2B marketplace

indiamart.com Source > Supply > Grow

global sources

DHgate.com #WeDoCare

Made-in-China.com Source Quality Products Made in China

Alibaba.com® Global trade starts here.™

Drivers of e-procurement

- Cost reduction
- Improvement in oversight
- Process improvement
- Increased process transparency
- Individual performance
- Increased supplier management

Highlights from the report

- On average, best-in-class enterprises have requisition-to-order cycle times of one to two days, which is more than half of their peer firms, with transactions costs that are 33% lower than all other enterprises.

- E-procurement has improved cost savings and can streamlining internal processes while enhancing supplier relationships.

- Procurement department is no longer just a transaction center for placing orders, but can also be a source of competitive advantage by acting as an information hub supporting business planning and decision making.