

# SUPPLY CHAIN DYNAMICS, AGILITY AND RELATIONSHIP MANAGEMENT: BSS 421



## **WEEK 16 : GLOBAL SUPPLY CHAINS : EMERGING TRENDS**

**DR. MARY KAREI KIBUINE**

# Task for the Week



Last week I requested you to think of emerging issues that are impacting on the environment where you stay.

In my environment the following seem to be trending.

- 1. Use of social media as a major means of communication, selling and buying of goods for personal and house hold use.**
- 2. Young people have different behaviour on how they relate with each other.**
- 3. Growth of services as opposed to people doing certain functions by them selves.**
- 4. Breaking of cultural barriers among people.**
- 5. There is more importation of goods than before. A lot of manufactured goods come from other countries.**
- 6. There is growth of construction industry driven by growth of proper industry.**

# Summary of Supply Chain Dynamics Module



What we have been learning can be summarized as ;

1. Trends affecting supply chains.
2. Manufacturing/ Business orientations
- 3.
4. Supportive manufacturing
5. Supply Chain Complexity
6. Supply chain Relationships
7. Technology and supply chain dynamics
8. Global supply Chains

# Objectives of this Week's Topic



The overall objective of the topic is to explain the emerging trends that have the greatest impact on supply chains. The specific objectives are ;

1. To describe general trends in global supply chains.
2. To describe how technology is impacting on supply chains.
3. To describe the relationship between emerging issues and supply chain dynamics.

# Introduction to Emerging Trends in Global Supply Chains



Lai (2024) observes that globalization and the rapid pace of change of technological are posing a great challenge and opportunities for global commerce, logistics and supply chain management. The observed trend that require strategic approach are ;

1. **Customization and Personalization:** Consumers are demanding customized products that require flexible and responsive supply chains.
2. **Global Trade Dynamics:** There is shifting in trade agreements, tariffs, and geopolitical dynamics that are making international supply chains more complex. This is driving the need for diversification and adaptability to new markets.

# Introduction to Emerging Trends in Global Supply Chains Cont'd



**3. Direct delivery to customers:** This bypasses traditional retail channels. It allows for better profit margins and a direct relationship with consumers but demands a rethinking of logistics and distribution.

**4. E-commerce Growth:** The rise in e-commerce demands quicker fulfilment, more flexible last-mile delivery solutions and robust reverse logistics where necessary.

Lai, Y. (2024) Innovative Strategies in Logistics and Supply Chain Management : Navigating Modern Challenges  
Web of Conferences.

<https://doi.org/10.1051/shsconf/202418302020>

# Introduction to Emerging Trends in Global Supply Chains



- 5. Circular economy:** Governments and consumers are demanding more focus on sustainable practices, reduction of waste through out the entire lifecycle of products.
- 6. Supply chain resilience:** This is the ability of a supply chain to be flexible and resilient in adopting quickly to unforeseen challenges such as the covid -19 pandemic.
- 7. Increase in service supply chains:** Services industry seem to be overtaking product based industries in terms of contribution to a country's Gross Domestic Product (GDP) of a country. Service delivery and customer satisfaction are key.

# Introduction to Emerging Trends in Global Supply Chains



## 8. Demographic structure.

- It demonstrates a clear differences between the people born in computer era and those born in non computer era. Young people such as millennials and generation Zee have much of their lives revolving around internet. They socialize and buy goods over the internet. They demand services and old factors of production such as land may not have much consideration.
- There is obvious differences in demand of goods in developed and less developed countries. Developed nations have old population with disposable income while developing nations have young population with high demand for consumer goods.

# Introduction to Emerging Trends in Global Supply Chains



**9. Ethical and transparent supply chains:** Consumers and regulators are pushing for more ethical practices in supply chains such as safe working conditions, ethical sourcing non – exploitation of work force.

**10. Integrated planning and Execution:** Functions such as procurement, production, distribution, and sale need to work together across the supply chain. Also buyers and suppliers have relationships that enable them to collaborate in buying and selling processes.

# Emerging Technologies and Supply Chain Dynamics



## **Artificial intelligence and machine learning.**

- Artificial intelligence is a concept of creating intelligent machines that can simulate the ability and behavior of human thinking, while machine learning is an application or subset of artificial intelligence that allows machines to learn from the data without being programmed.

## **Impact of AI and machine learning on supply chains.**

### **1. Reduced forecast errors:**

It has the ability to analyze large amount of data that varies greatly owing to telematics, internet of things (IoT) devices intelligent transportation systems and other technologies.

# Global Supply Chains: Emerging Issues in Technology



## Impact of AI and Machine learning on supply chains.

1. **Prediction of demand:** They collect historical data and uses it to predict the future demand.
2. **Quality Control:** It has the ability to detect defective or damaged products through visual recognition.
3. **Improve supplier delivery performance and reduce freight cost:** The technologies are used to identify horizontal synergies between a network of multiple shippers.

# Global Supply Chains: Emerging Issues in Technology



## **Impact of Artificial intelligence and machine learning Cont'd**

**5. Inventory control Management:** by estimating the right quantity to be stocked as well as prevent both understocking and overstocking

**6. Improve supply chain performance:** Provides complete visibility of supply chain to enhance management of key performance indicators.

**7. Reduced inventory and operation cost:** AI has the capacity to assess and learn from real time data and historical delivery records which helps supply chain experts in optimizing the route for their fleet of trucks, resulting to reduced cost; time and productivity increase.

# Global Supply Chains: Emerging Issues in Technology



## Impact of Artificial intelligence and machine learning Cont'd

7. **Enhancing quality management of suppliers and compliance** by finding quality patterns and following up data hierarchies for every vendor.
8. **Shortens customer response time:** automatic matching and controlling of demand and supply and improving customer experience.
- 10 . **Efficient production planning:** Machine learning techniques may be used to train complex algorithms on production information.

# Global Supply Chains: Emerging Issues in Technology



## Impact of Artificial intelligence and machine learning Cont'd

**11. Forecasting demand:** by matching demand and supply.

**12 Fraud prevention:** it automates auditing procedures and inspection procedures and performing real time evaluation of the variances from regular patterns.

**13 Increasing data security** by tracing the source of input or alteration

# Global Supply Chains: Emerging Issues in Technology Cont'd



## Block chain technology

- Is a decentralized digital ledger that records transactions between multiple parties in a secure and verifiable formats. It is associated with crypto currencies.
- Blockchain technology allows unlimited number of anonymous users to conduct secure transactions with each other without a central intermediary.
- Supply chain users can protect business operations from attacks or stealing of classified information.
- It also allows faster product delivery, by improving product traceability, movement coordination between parties, and facilitates fast payment.

# Global Supply Chains: Emerging Issues in Technology



## Block chain technology Cont'd

- **Facilitates transaction processes.** A blockchain protocol database run automatically to validating and execute terms and conditions of a contracts between parties.
- **Tracking:** It provides real time visibility of products from the source to the end user.
- **Fraud detection and prevention:** In block chain all information is encrypted to enhance security. Users are prevented from changing the information in the block chain thus it helps in detecting procurement fraud. It also enhances traceability and audit trail of all transactions hosted.

# Global Supply Chains: Emerging Issues in Technology



## Block chain technology Cont'd

1. **Quick transaction process:** No scan and mail documents that are required between parties. Information exchange is real time.
2. **Data exchange:** Information can be exchanged or made available to supply chain members in the format suitable to them, therefore conflicting standards of integration is avoided.
3. **Enhance customer satisfaction:** Customer order can be traced while on transit.

# Global Supply Chains: Emerging Issues in Technology



## Block chain technology Cont'd

4. **Better communication and transparency:** With blockchain, all information is stored in a single location that can be viewed by all members with the necessary access key, providing an efficient means to connect clients; couriers; orders and payments in real time.

5. **Reduced cost:** Costly documentation fees, procedural delays, discrepancies and errors can be avoided by replacing old methods with a blockchain strategy.

6. **Elimination of paper work:** with block chain all documents are automated thus increasing efficiency.

# Global Supply Chains: Emerging Issues in Technology



## Internet of things (IoT) Technology

- It is a collection of interconnected physical devices capable of monitoring, reporting, sending and exchanging data.
- Internet of things devices are often connected to computer systems via data networks or Wi-Fi.
- In supply chain, Internet of Things devices are an efficient way to track and authenticate products and shipments using GPS and other technologies. They can also monitor product storage conditions, leading to improved quality management throughout the supply chain.

# Global Supply Chains: Emerging Issues in Technology



## Internet of things (IoT) Technology

1. Identify the location of the goods at any time: IoT devices can be connected to specific storage containers or the goods themselves. The system transmits their location, which can be captured by GPS satellites and used to track the movement of goods.
2. Tracks the speed of movement of goods: the system makes it easier to predict how goods will move along the supply chain. Suppliers, manufacturers and distribution centers can prepare to receive goods, which reduces handling times and ensures efficient material processing.

# Global Supply Chains: Emerging Issues in Technology



## Impact of IoT in the supply chain Cont'd

- 3. Storage condition monitoring:** Specialized IoT devices can monitor various aspects in the warehouse such as temperature, humidity, light intensity, and other atmospheric factors. These devices can also trigger an alarm if certain thresholds are exceeded.
- 4. Enhance contingency planning:** Freight tracking and route planning via IoT devices can identify where and when freight is delayed in transit. This allows for contingency planning and alternative routes to speed up flow in the supply chains.

# Global Supply Chains: Emerging Issues in Technology



## Impact of IoT in the supply chain Cont'd

### **6. Administering goods immediately after receiving them:**

Verified tracking via IoT devices means supply chain function can validate arrival time of goods . This can trigger other administrative activities such as supplier payments or subsequent shipping requests.

# Global Supply Chains: Emerging Issues in Technology



## 5G Network Technology

- It is the fifth-generation wireless mobile technology that provide higher speed, greater capacity and lower latency compared to fourth generation mobile networks.
- It has ability to track the movement of goods and information in real time in supply chain anywhere in the world.
- 5G networ allows monitoring many of many devices simultaneously at high speed and responsiveness.

# Global Supply Chains: Emerging Issues in Technology



**5G Network Technology impacts the supply chain in the following**

- 1. Tracking and tracing of goods:** 5G-enabled sensors are used to improve product tracking in warehouses. Industries that ship large volumes of small packages or combine kit products will be able to track individual products and components. 5G network make it easier and more effective to monitor atmospheric conditions sensitive products.

# Global Supply Chains: Emerging Issues in Technology



## **5G Network technology cont'd**

**2. Inventory management:** 5G allows supply chain function to track the stock keeping units level so as to have a more detailed understanding of what condition their product is in, where it is, and when it will reach their customers.

**3. Internal and external connection:** It penetrates buildings without physical connectivity, 5G networks can combine internal and external supply chain operations. It links mobile communications such as Local Traffic Manager (LTM) and 4G for the outdoors with indoor technology such as Wi-Fi. E.g. freight forwarders can re-route orders while on transient.

# Global Supply Chains: Emerging Issues in Technology



## Impact of 5G Technology cont'd

**4. Real-time data sharing:** The reduced latency of 5G means that there is little time between the moment a sensor detects an event and the moment the system recognizes it. For the supply chain, reduced latency can enable vehicle-to-vehicle communication for automated trucks and warehouse robots.

**5. Streamline logistics operations:** With 5G network, logistics functions can automatically label, track and record all shipments, which solves a number of problems such as lost goods, lost containers, counterfeiting, smuggling and generally inefficient manual processes.

# Global Supply Chains: Emerging Issues in Technology



**6. Smooth fleet management operations:** 5G network has the ability to allow real-time responses to vehicle safety status and collision avoidance. Autonomous vehicles use advanced sensors to keep them within specific lanes, avoid collisions, implement real-time delivery status updates and seek emergency services.

**7. Warehouse management:** 5G network technology can improve and automate the performance of robots. It allows instant communication between machines and which in turn can be used to automate warehouse.

# Global Supply Chains: Emerging Issues in Technology



1. Badru, A. ( 2023). Key trends in supply chain management and their implications trends in supply chain management and their implications.DOI:10.13140/RG.2.2.28644.04486
2. Abhijeet, S . Asita ,G. Nilesh L. Suvarna, S. Sathe, T. Maharashtra , V. Joe , L.(2023) , Emerging Trends in Supply Chain Management and its Impact on Business Operations . The Empirical Economics Letters 10.5281/zenodo.8432190
3. IMM ( 2023) . Emerging trends in supply chain management & logistics

-----**END**-----



- As we end this module I summarize what we have learnt as follows;
- Supply chains and related dynamics are the source of challenges that humanity is facing and not people themselves. What happens in one part of the world affects as all. Let us do what is positive where we are and we will impact on somebody somewhere else in the world.

***THANK YOU HUF TEAM FOR FACILITATED  
THE PRODUCTION OF THIS MODULE.***

-----**END**-----



*THANK YOU ALL*