DISRUPTIVE TECHNOLOGIES IN LOGISTICS AND THEIR POSITIVE ENVIRONMENTAL CONSEQUENCES

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OUTLINE

• DISRUPTIVE TECHNOLOGIES
• ADVENT OF THE INTERNET
• THE DYNAMICS OF THE POST-DIGITAL ECOSYSTEM
• INTERNET OF THINGS
• 3D PRINTERS
• AUTONOMOUS VEHICLES
• BLOCKCHAIN
• **Disruptive innovation** creates a new market and value network and eventually disrupts an existing market and value network.

• A **disruptive technology** displaces an established technology and shakes up the industry and creates a completely **new industry**.

• Disruptive technologies cause the business processes to be **redesigned**.
After the rise of internet, digital economy has started to impact all sectors including retail, transports, financial services, manufacturing, education, culture, healthcare, and media industries.

Internet brings about fertile ecosystem for the disruptive technologies.

These technologies eliminate many business lines but do not create the same amount of jobs since it requires less labor.

The product life cycle is getting shorter and technological developments are getting faster.
• The most important **production factor** in digital economy is information.

• Today, regarding access to information, there are essential **differences** among individuals who has and has not accessed to the internet.

• This differences trigger consecutive inequalities.
THE DYNAMICS OF THE POST-DIGITAL ECOSYSTEM

• The digital divide refers to the unequal distribution of technological infrastructure usage within society.

• On the one hand, a computer user who takes advantage of communication possibilities.

• On the other hand, there is a class devoid of basic communication facilities.
• There is a relationship between income level and internet access.

• Today, all the routine works are taken over by machines.

• Therefore this causes economic inequality.
INTERNET OF THINGS

Intelligent Systems for a More Connected World

- **7 Connected Devices per Person**
  - By 2020, each person will own an average of 7 connected devices.

- **71% of Shoppers are Multi-Channel**
  - Based on respondents planning their 2011 holiday shopping.

- **23.6M Connected Cars**
  - 23.6 million cars will have Internet access by 2016, rising from 8.7 million in 2010.

- **Data Breach**
  - Medical data disclosure is the second most breached source of data.

- **30% Annual Growth Rate**
  - Projected increase in connected machine-to-machine devices over the next 5 years.

**Communications**
- Managed
  - Shares data through internet and the cloud
- Secured
  - Protects data against malware, theft and tampering

**Medical**
- Managed
  - Shares data through internet and the cloud
- Secured
  - Protects data against malware, theft and tampering

**Retail**
- 71% of Shoppers are Multi-Channel
- Based on respondents planning their 2011 holiday shopping

**Industrial**
- 30% Annual Growth Rate
- Projected increase in connected machine-to-machine devices over the next 5 years

**Vehicles**
- 23.6M Connected Cars
- 23.6 million cars will have Internet access by 2016, rising from 8.7 million in 2010

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3. Deloitte Human Capital, "Executive Summary: The Internet of Things: How connected objects will transform business, government, and society", 2013
INTERNET OF THINGS

- Warehouse Operation
- Freight Transportation
- Last Mile Delivery
INTERNET OF THINGS

Warehouse Operations

• Smart inventory management
• Damage detection
• Real time visibility
• Accurate inventory control
Sensors in Freight Transport

- Fleet Management
- Predictive Asset Maintenance

Image credit: http://www.mouser.com
Last Mile Delivery: IoT and Mail Delivery/Pickup

- Optimize mail pickup
- Notify customer of delivery
- Flexible delivery address
- Maximize return trip
INTERNET OF THINGS

Last Mile Delivery:
IoT: Automatic replenishment and anticipatory shipping

- Smart Lockers
- Delivery on first attempt
- Tracking expiration dates
- Anticipate Orders
3D PRINTERS
• Decentralize the production.

• Lead to **reduction in the shipping** and **air cargo volumes**.

• Reduction in warehouse requirement.

• Reduce carbon emission and reduce product carbon footprint
3D PRINTERS

Storage and warehousing are obligaliton

• Remove the need for warehouse, decrease the packaging cost

• less obsolescence of existing stock.

• It will accelerate a shift from “push supply chains” to “pull supply chains.”

• Increase customization.
AUTONOMOUS VEHICLES

DAF
Daimler
Iveco
MAN
Scania
Volvo
Six brands of automated trucks have been driving in columns (platooning), on public roads from several European cities to the Netherlands.

Truck platooning will ensure cleaner and more efficient transport.

Self-driving vehicles also contribute to road safety because most accidents are caused by human failure.
- Blockchain Based Supply Network Management System
- Autonom & Distributed Trust Model
BLOCKCHAIN
• **Time savings:** Transaction settlement is faster because it doesn’t require verification by a central authority.

• **Cost savings:** Intermediaries are eliminated.

• **Tighter security:** Protect against tampering, fraud, and cybercrime.

• **Enhanced privacy:** Users can specify which transaction details they want other participants to be permitted to view.

• **Improved auditability:** Ability to monitor and audit transactions.

• **Increased operational efficiency:** Facilitate the transactions.

• **Building trust:** Increasing the level of trust among network participants.
THANK YOU