

# INTEROPÉRABILITÉ DES OPÉRATIONS LOGISTIQUES ET LA NOTION D'INTERNET PHYSIQUE

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Shenle Pan  
Enseignant-chercheur (HDR)  
Centre de Gestion Scientifique  
MINES ParisTech - PSL

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### ■ Initiatives des grands acteurs et start-ups

Logistique



LA POSTE

fulfillment by **amazon**

Storage. Shipping. Support.

Monarch**Fx**  
Smarter Logistics.



Transport



**Mix Move Match**  
Transform Your Supply Chain and Radically Reduce Costs and Carbon Footprint



Stockage



FLEXE connects you to warehouse capacity **when, where, and how** you need it.

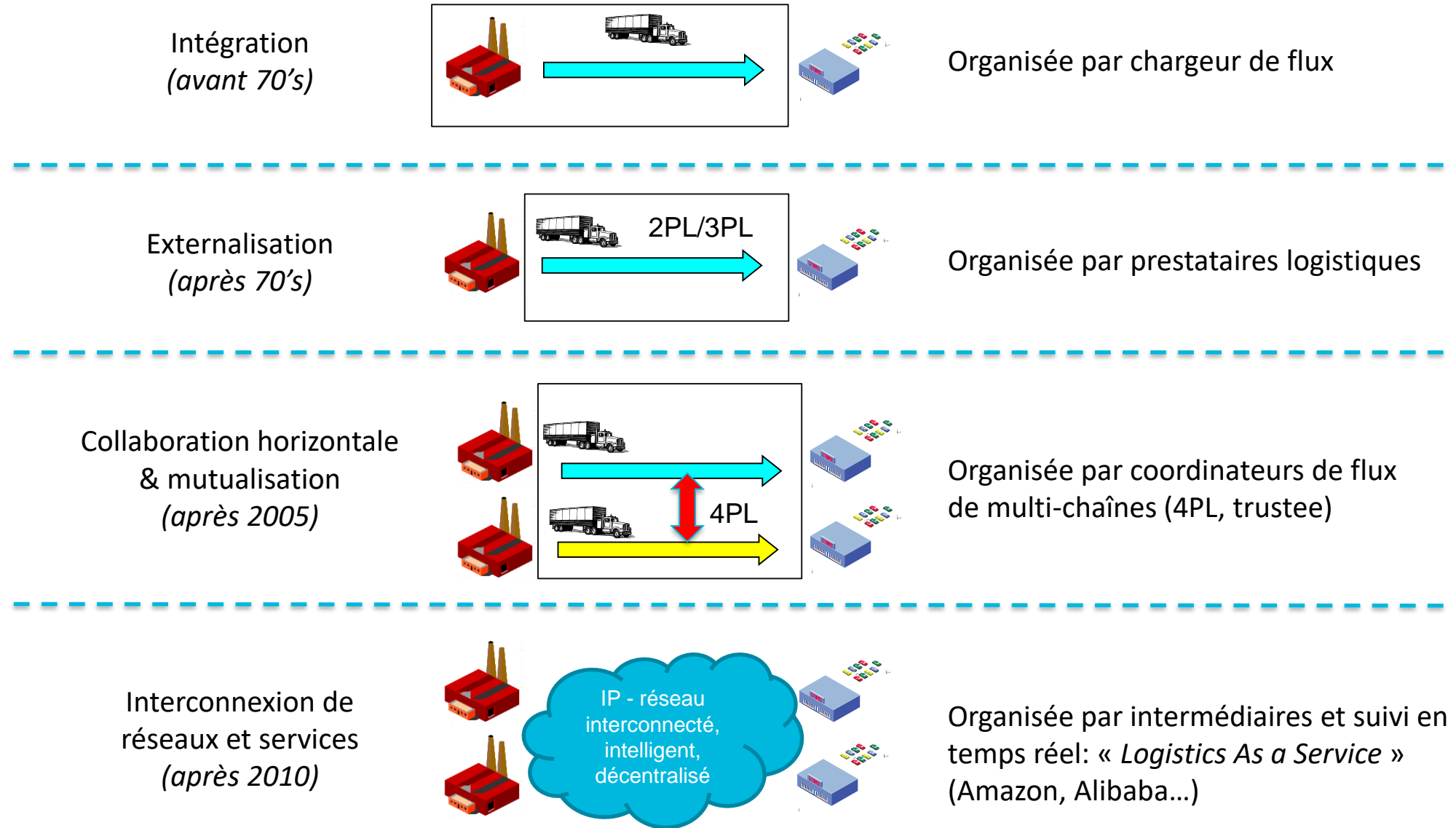


Informatique,  
Données,  
Traçabilité

...

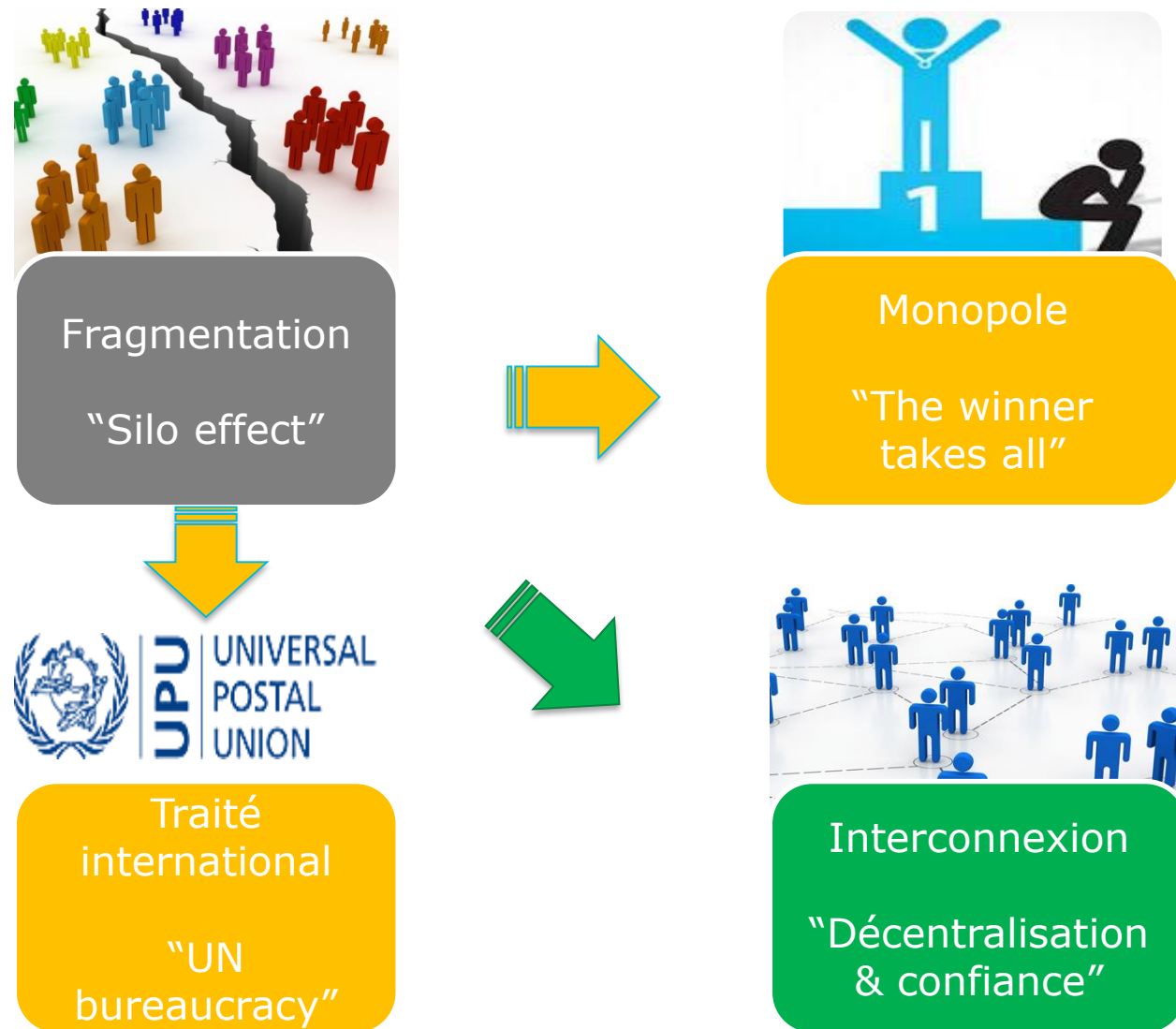
# 1. DES SILOS VERS LES RÉSEAUX

Tendance de l'interconnexion des plateformes et réseaux logistiques



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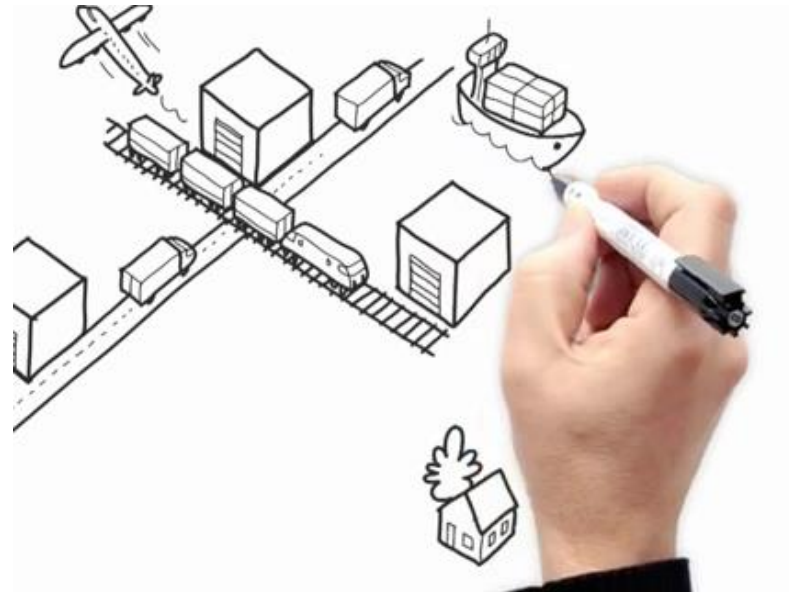
Tendance de l'interconnexion des plateformes et réseaux logistiques



## ■ Définition

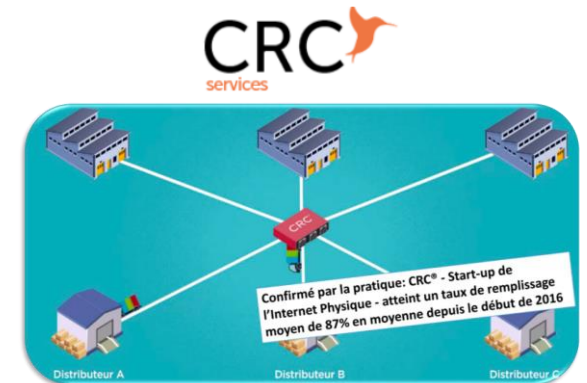
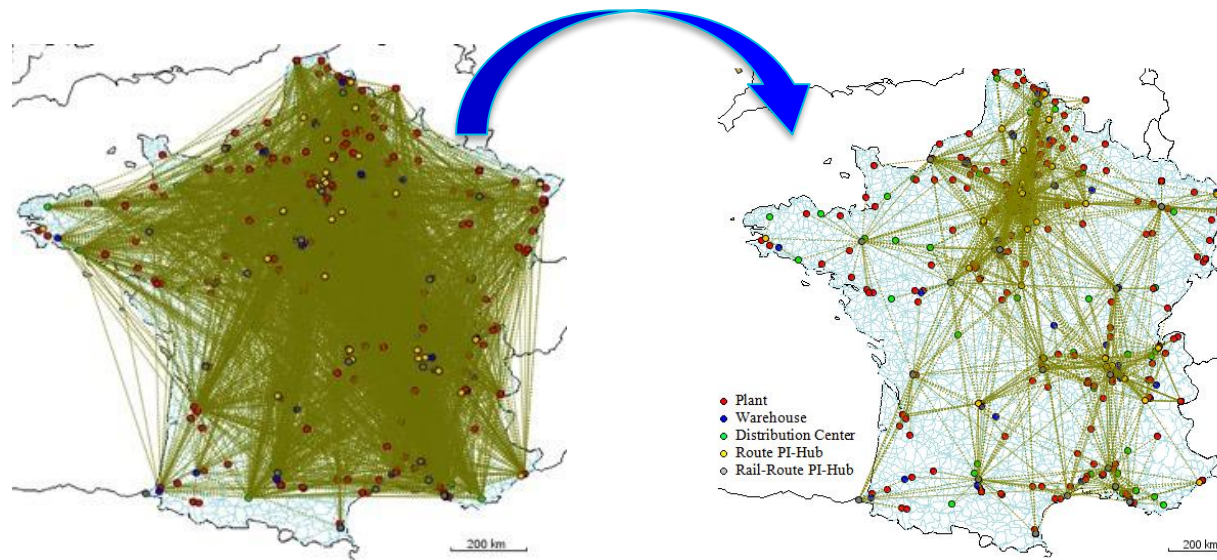
The Physical Internet is an **interconnected global logistics** system enabling **seamless asset sharing and flow consolidation**

Source: B. Montreuil, R. D. Meller & E. Ballot (2011)



<https://www.youtube.com/watch?v=4vc7XoEYUs8>

## ■ Réseau ouvert, partagé et décentralisé



**Mix Move Match**  
Transform Your Supply Chain and Radically Reduce Costs and Carbon Footprint

**STOCKBOOKING**<sup>®</sup>

Etudes de simulation dans la grande distribution montrent:

- Emission CO2 en transport [-12%, - 55%]
- Coût de transport [-4%, -30%]
- Coût de stockage [-10%, -30%]

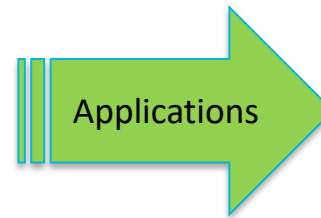
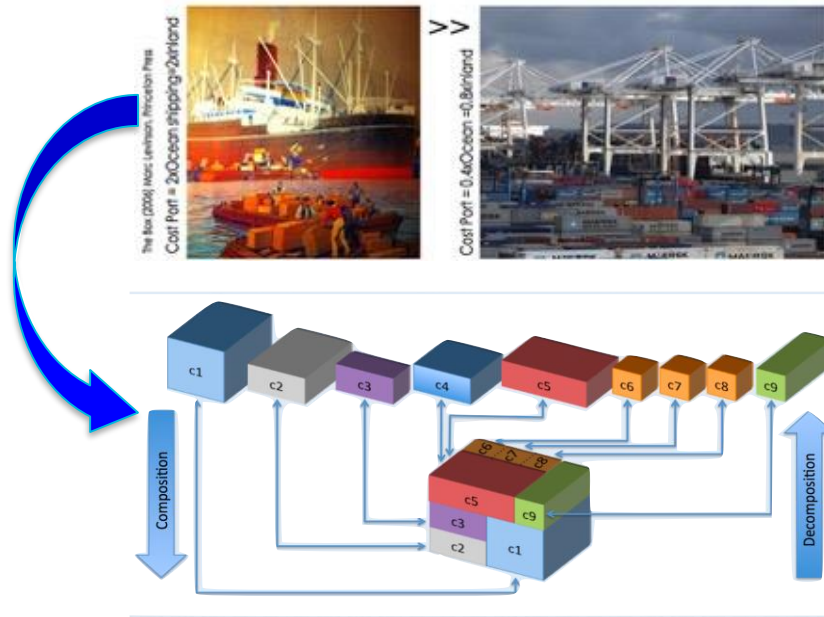
*Thèses: Rochdi SARRAJ(2013), Yanyan YANG (2016)*

*Sarraj et al. (2014) Interconnected logistic networks and protocols: simulation-based efficiency assessment. IJPR. 52(11)*

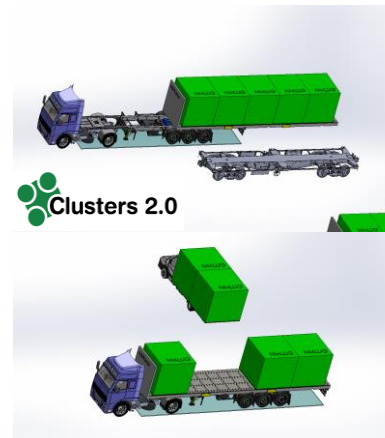
*Sarraj et al. (2014) Analogies between Internet network and logistics service networks: challenges involved in the interconnection." JIM 25(6)*

*Yang et al (2017) Freight Transportation Resilience Enabled by Physical Internet. IFAC-PapersOnLine 50(1)*

## ■ Standardisation et modularisation (matériels, outils informatiques, procès)



### Conteneur de Transport



### Conteneur de Manutention



Etudes montrent :

- Taux de remplissage global +15%
- Coût de manutention -5% chez industriel, et -30% chez distributeur

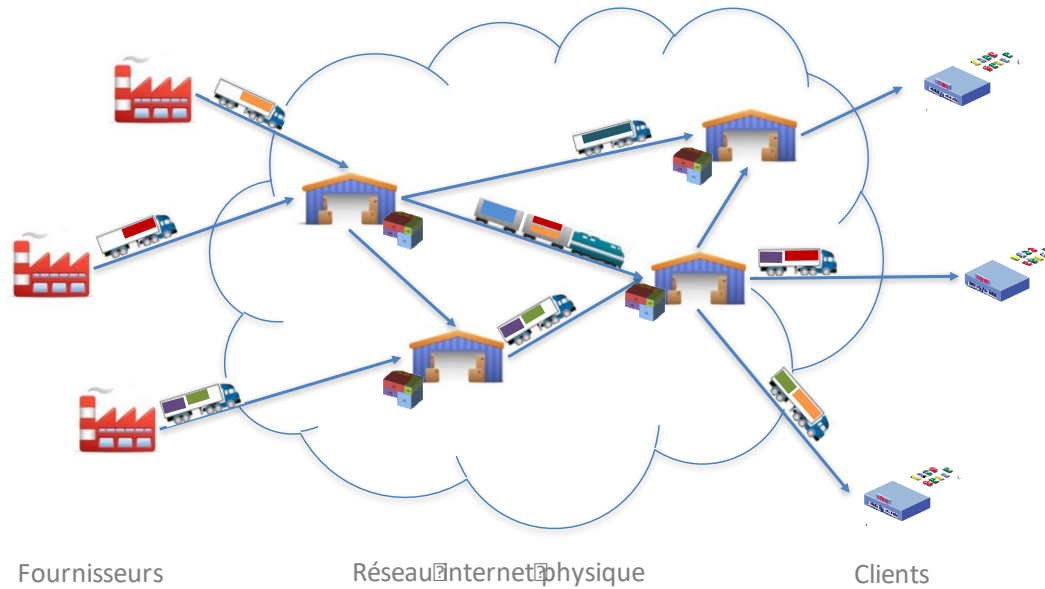
### Traçabilité avec technologies IoT



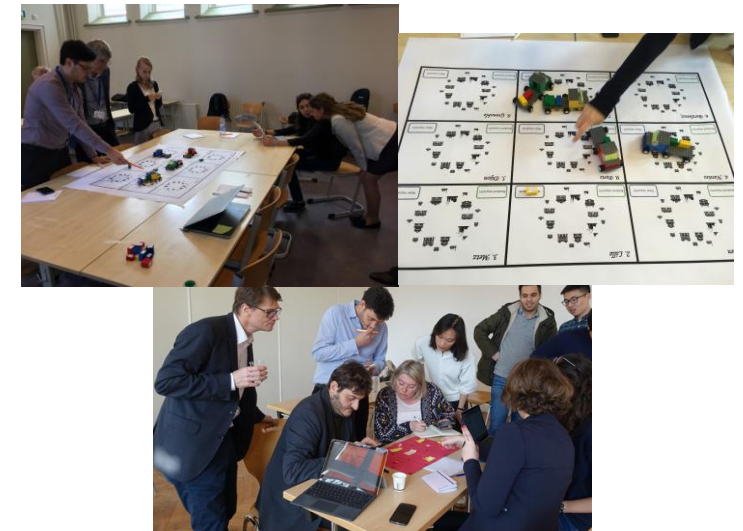
Sarraj et al. (2014) Interconnected logistic networks and protocols: simulation-based efficiency assessment. IJPR, 52(11)  
 LIN et al. (2014) A decomposition-based approach for the selection of standardized modular containers. IJPR, 52 (15)



## ■ Protocoles de collaboration/coopération (comme TCP/IP pour Internet)



### Gamification – jeu de transport



### Plateformes intermédiaires



- Protocoles de routage collaboratifs et résilients
- Mécanismes et règles de collaboration: *individuel vs global*
- Nouveaux modèles d'affaires d'intermédiation

**Thèses:** Bin Qiao (2018), Mariam Lafkihi (en cours)

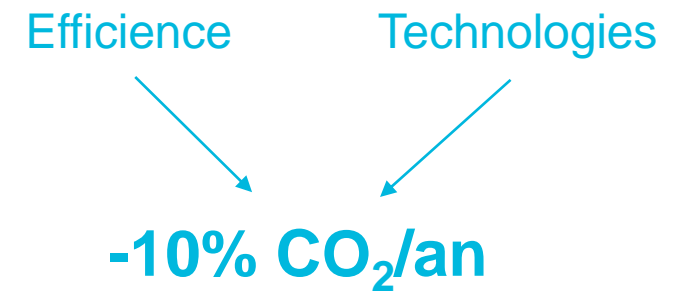
Qiao et al. (2016). Dynamic pricing model for less-than-truckload carriers in the Physical Internet. *JIM*, (in press)

Lafkihi et al. (2017). Mechanisms for freight transportation service procurement: a literature-based analysis. *CIE47*, Lisbon, Portugal

Pan et al. (2014). Auction-based transport services allocation in Physical Internet: a simulation framework. (*ILS2014*). Breda, Netherlands.

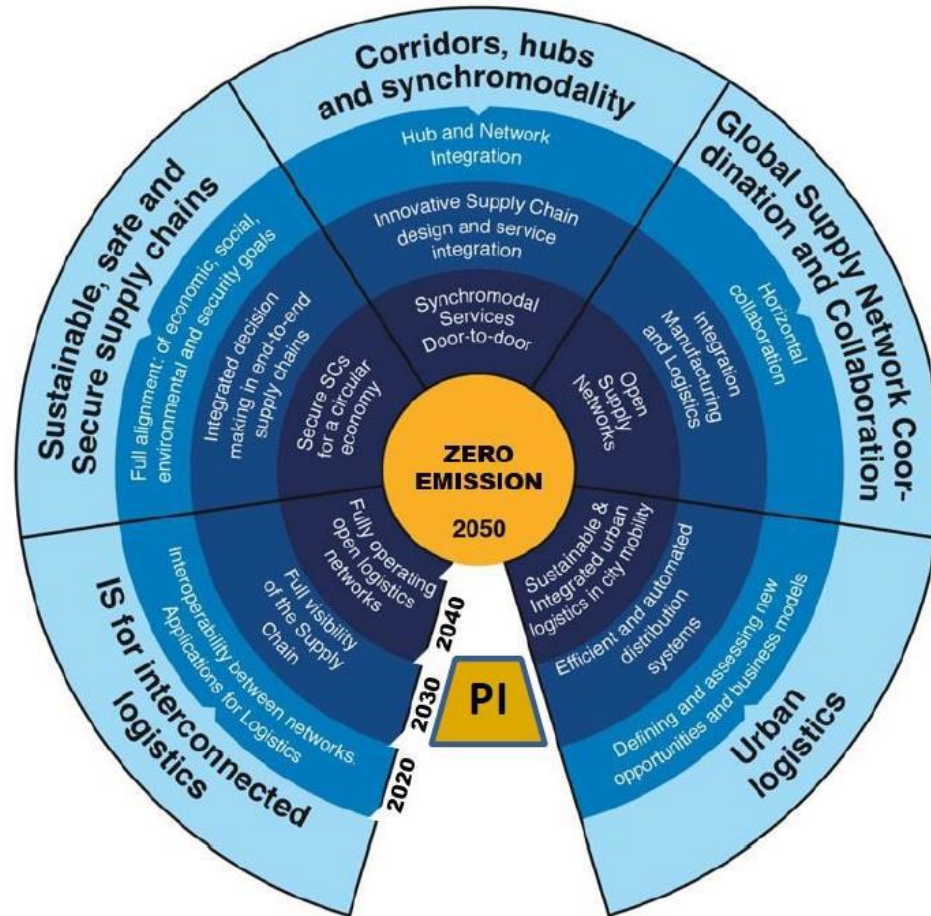
## ■ Chaire Internet Physique: [www.cip.mines-paristech.fr](http://www.cip.mines-paristech.fr)

- Axe 1 - Fondements scientifiques de l'interconnexion des réseaux logistiques
- Axe 2 - Modèles de performance de l'Internet Physique
- Axe 3 - Plateforme d'intermédiation et gouvernance décentralisée
- Axe 4 – Logistique urbaine interconnectée et durable



The University of Hong Kong

- Conception collaborative de roadmap 5 axes vers Internet physique
- 2050 logistique de “zéro émission” en Europe, par Internet Physique en 2030



**alice** | Alliance for Logistics Innovation through Collaboration in Europe [www.etp-logistics.eu](http://www.etp-logistics.eu)

ALICE membership per type of organization		
Type of Organization	Members	EU/International Associations
Shippers & Retail	P&G, SOLVAY, Ford, Mondelez International, Casino, HOFER, BAYER, ZÜRCHER	ESC, cefic, ELUPEG, GSI
Logistics Service Providers, Courier and Postal operators & Freight Forwarders	Dachser, KLEIDO, FM-LOGISTIC, Posteitaliane, LINEAS, GEODIS, BORUSAN LOJISTIK, CHEP	CLECAT, EALTH, RU
Ports, Hubs, Intermodal terminals & Transport Infrastructure	Port of Rotterdam, HANSAWÄRDEN, ECO SLC, HUTCHISON PORTS, ECT ROTTERDAM, STERPEN, TRAFIKVERKET, JLL, INTERPORTO BOLOGNA, duisport, VALERIO LOGISTICA	CEP, INE, TEPORT
Vehicle Manufacturers & Logistics operations, handling (modular units)	VOLVO, MAN, DAIMLER, LOGIFRUIT	eucar
Information and Communication Technologies & Consultancy	AIA, ADANTECH, log.sea, BIMAR, nallion, PNO, SILENT SENSORS, TRAXENS, everis, GEA, bluegreen, enjoe, espacita, FERRA, HaCon, PTV GROUP	ERTICO, CLEAN GREEN
Regional & Member States Logistics Clusters	vni, vni, Eurologistic, CLOSER, LUTB, LIMOWA, nouelog, VIL	SMART FREIGHT
Research and technology Centers	Fraunhofer, Fraunhofer, CIC-LOGISTICA, ITCL, CATAPULT, IL, BIBA, TU/e, TNO	ECTRA, ELA
European Technology Platforms /PPPs	WATERBORNE, ERRAC, ETRAC, EFFRA, MANUFUTURE-EU	
Member States and innovation Funding*	MA, DINALOG, COIN, Vinnova, bmvi, VINNOVA	

# Merci

