

# ICT & hinterland transport

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**TU/e**

Technische Universiteit  
**Eindhoven**  
University of Technology

Where innovation starts

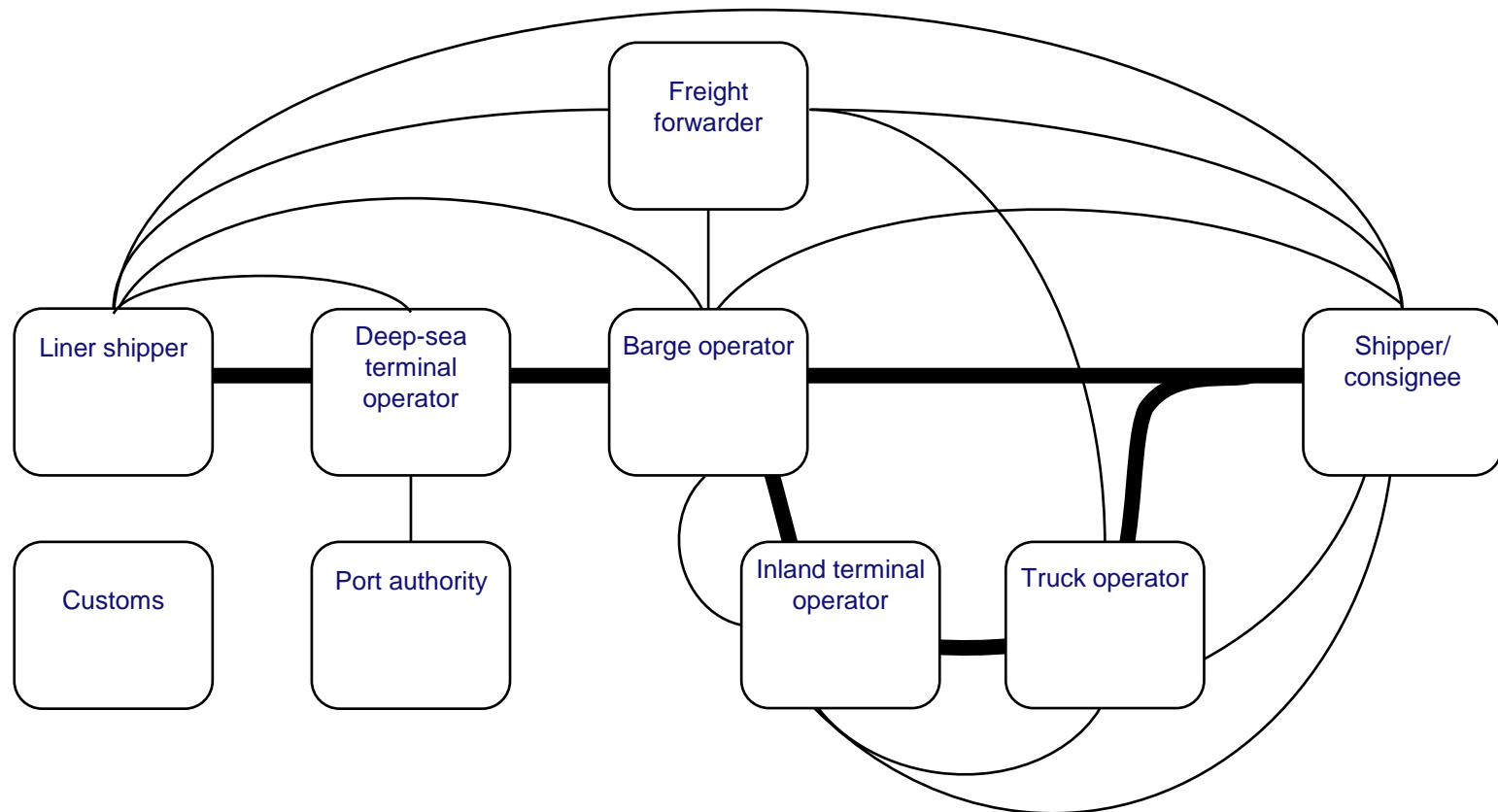
# Content

- **On the need to understand business models for successful innovations in ICT**
- **Business models in intermodal transport**
- **Coordination problems in intermodal transport**
- **ICT applications to improve (intermodal) chain efficiency**
  
- **NB: Focus of presentation & paper: hinterland chains from ports**

# On the need to understand business models for successful innovations in ICT

- **Mechanisms to improve coordination will only be successful if they are in line with the business model of the firms involved.**
- **Firms will not contribute to improved coordination when this has a negative effect on its market position or when it is not in line with its business model.**
- **Examples:**
  - **Destination information from forwarder to TOC**
  - **Slot availability from barge/train operators to users**
  - **Accurate ETA information (in some cases)**

# Understanding business models: the stylized intermodal chain



## Legend



Actor



Container flow



Contract

# Understanding business models: a figure with different layers of activities

- **Previous figure focuses on stylized roles in intermodal transport chains, in practice, different players engage in the same activities**
  - **Selling of transport services**
  - **Design of scheduled services**
  - **Terminal services**
- **A layer model allows us to understand better understand the scope of players in transport.**
- **This is still short of understanding their business model – but a first step**
- **NB: this is a underresearched issue**

Not further specified

Warehousing  
Repacking etc

1

(Re)design supply chain

2

Manage supply chain

ICT systems  
etc,

Not further specified

Logistics

Freight transport

3

Design door-to-door transport chain

Customer specific

Scheduled network

Container shipping

Sell scheduled transport service

Design scheduled transport service

Manage scheduled transport service

Container rail transport

4

Sell scheduled transport service

5

Design scheduled transport service

6

Manage scheduled transport service

Container barge transport

Sell scheduled transport service

Design scheduled transport service

Manage scheduled transport service

Container road transport

Sell scheduled transport service

Design scheduled transport service

Manage scheduled transport service

Loading & unloading    Storage    Movement of shipments

7

Loading & unloading    Storage    Movement of shipments

Loading & unloading    Storage    Movement of shipments

Loading & unloading    Storage    Movement of shipments

Infra. access    Provide transport equip.    Provide load unit

8

Infra. access    Provide transport equip.    Provide load unit

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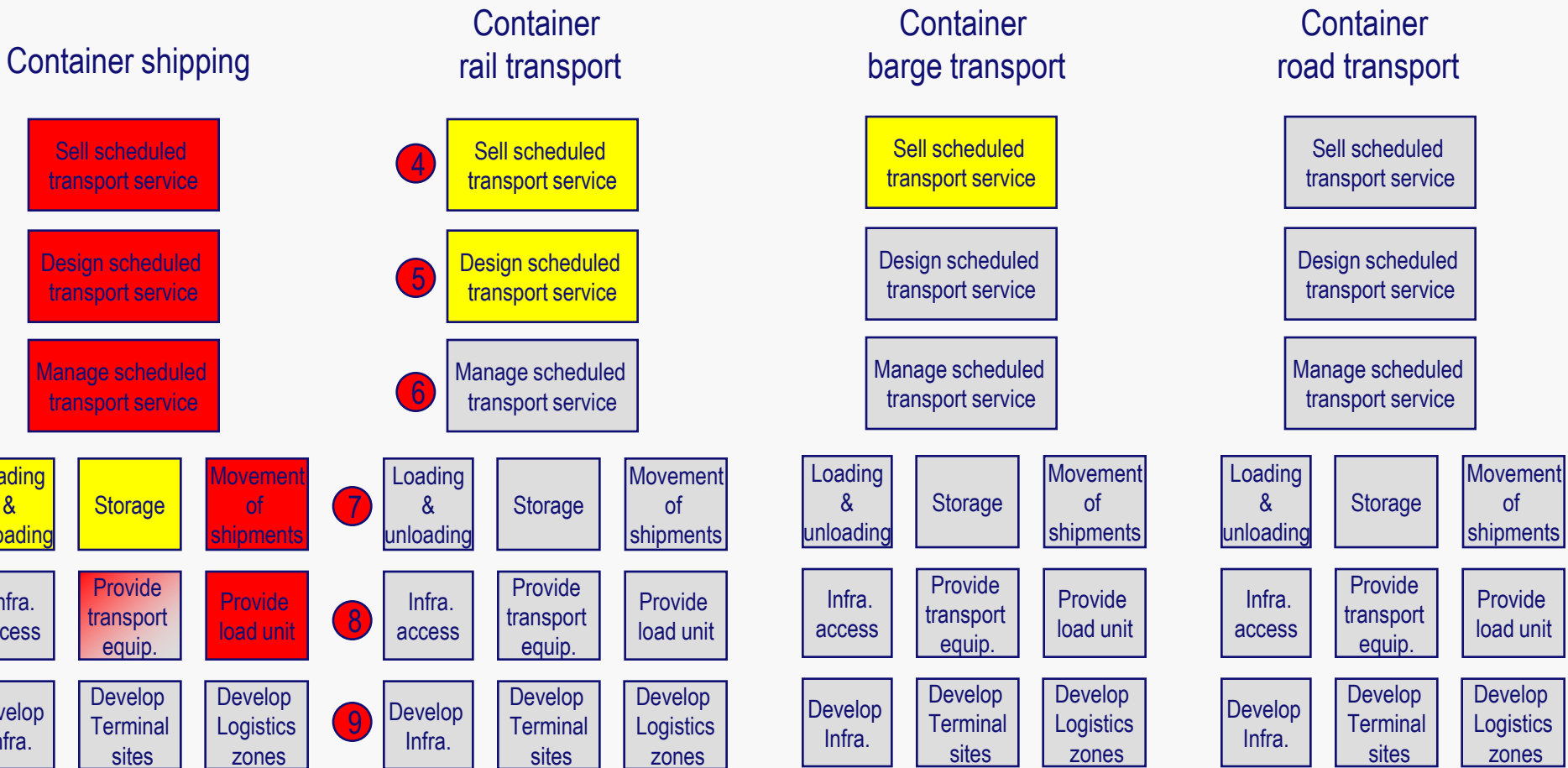
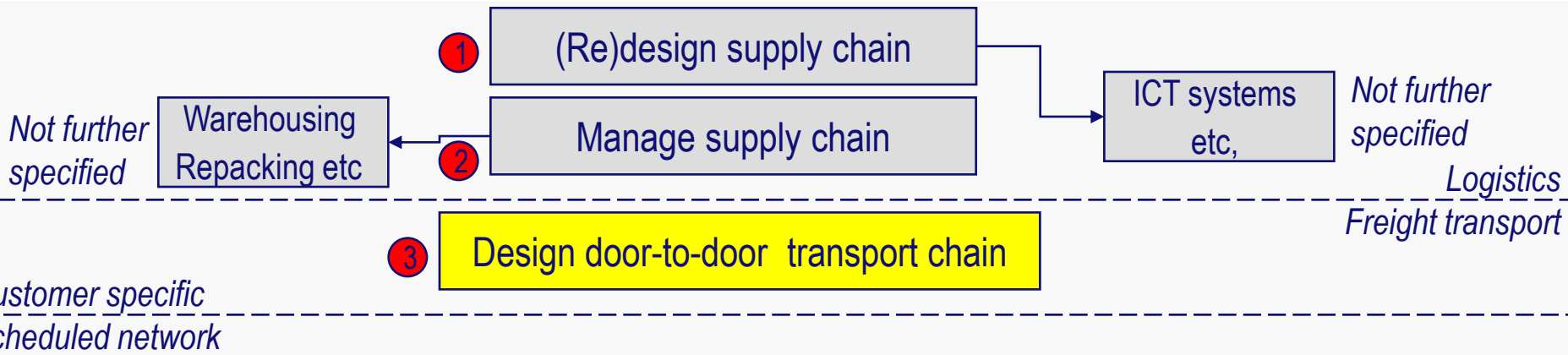
Develop Infra.    Develop Terminal sites    Develop Logistics zones

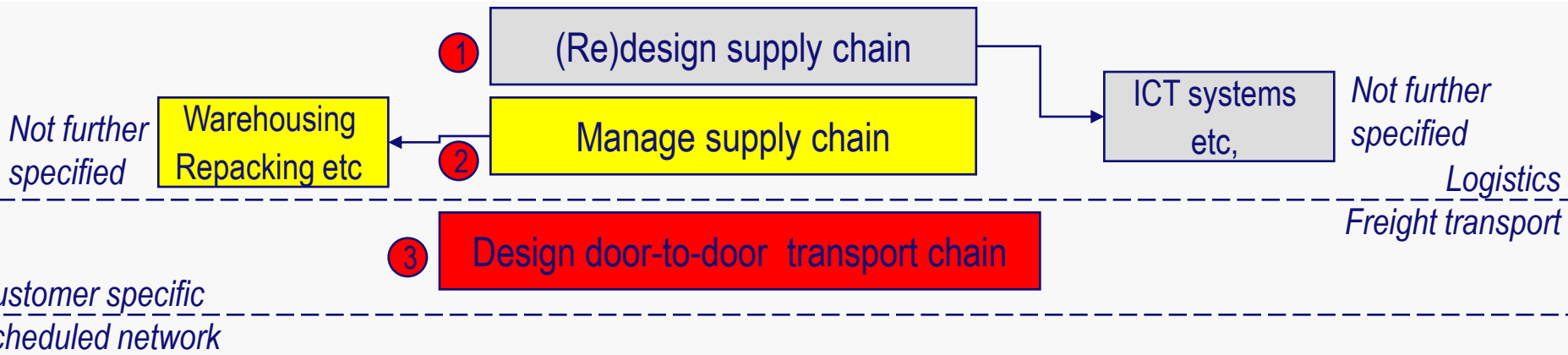
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Container shipping

Container rail transport

Container barge transport

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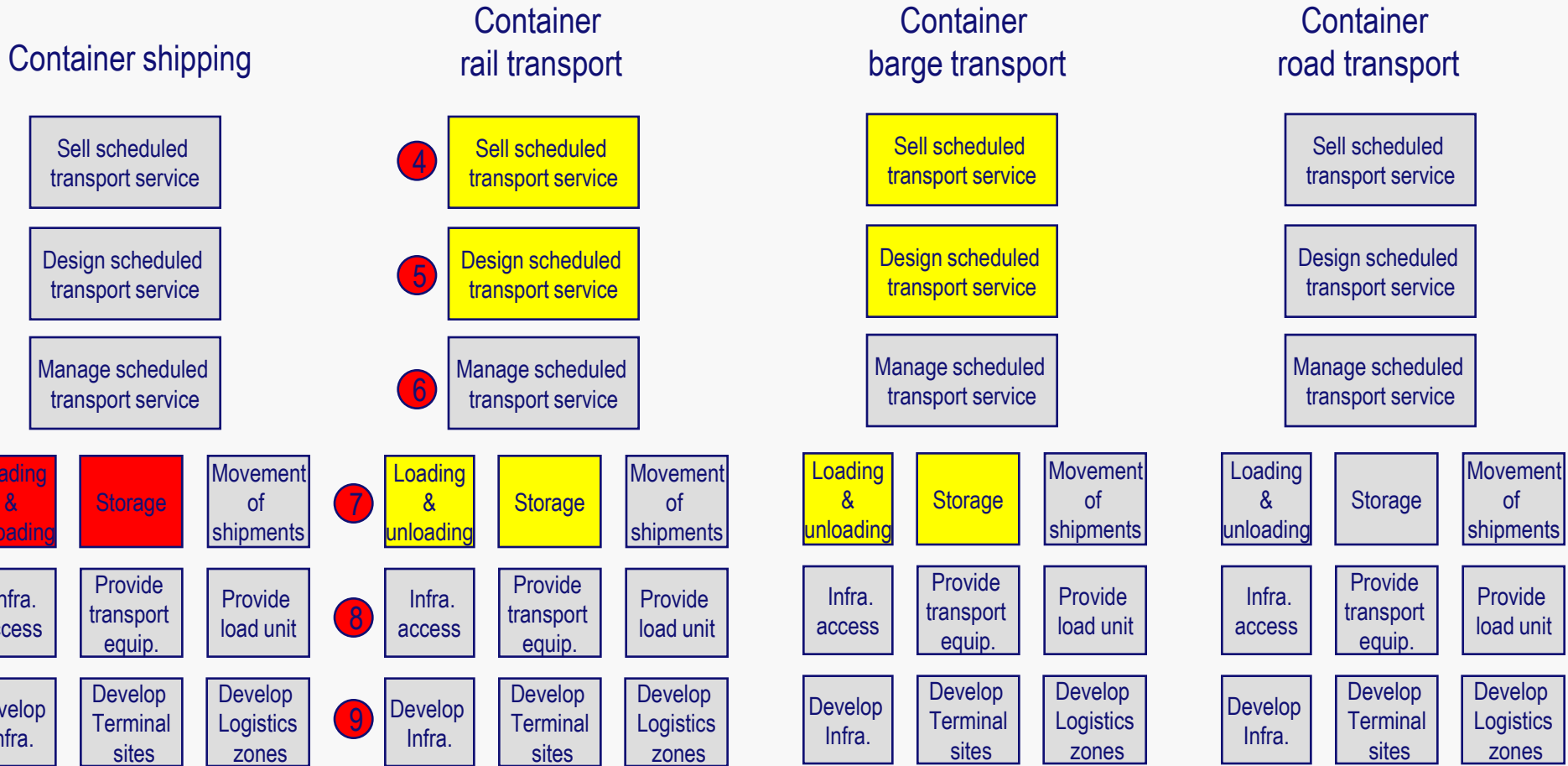
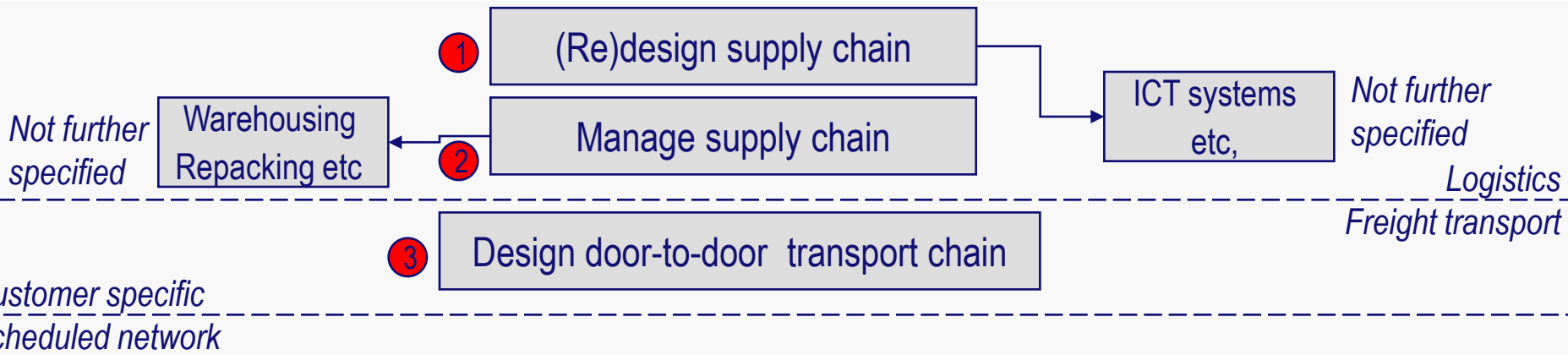
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# With this background in mind, we analyse coordination in intermodal transport

Transport mode	Coordination problem	Main actors involved
Barge	Poor alignment of terminal and barge activities. Results in long waiting times, uncertain port stay times, idle time of terminal quay resources etc.	Barge operator, container terminal operating company, terminal operator in port, forwarder
	Limited exchange of cargo between barge operators	Barge operator, forwarder
Rail	Poor alignment of terminal and barge activities. Results in peak load on terminals, long waiting times of trains.	Container terminal operating company, Rail terminal operator in port, rail terminal operator in hinterland, railway company, infrastructure manager
	Unused rail tracks because of insufficient information exchange and dynamic planning	Railway company, infrastructure manager
	Limited exchange of traction (locomotives), results in waiting times of trains at terminals and waiting yards	Railway companies
Truck	Poor alignment of truck and terminal activities. Results in peak hours at terminals, congestion on the roads, long waiting times for trucks etc.	Container terminal operating company, truck company, infrastructure supplier
	Limited exchange of cargo and truck capacity	Truck company, forwarder
Across all modes	Insufficient information exchange of container data causes inadequate planning and inefficient pick-up processes	Container shipping line, container terminal operating company, forwarder, truck company, barge operator, rail operator
	Investments in hinterland terminals do not come about spontaneously	Forwarder, rail terminal operator hinterland, barge terminal operator in hinterland
	Introducing new hinterland services requires volume; 'cargo controlling' parties do not commit to new services of other transport providers	Forwarder, shipper, container shipping line
	Insufficient planning on transporting and storing empty containers	Container terminal operating company, rail terminal operator in hinterland, barge terminal operator in hinterland, container shipping line

# Role of ICT

- **Facilitate information exchange**
- **Collect real-time performance data**
- **Facilitate coordination (or alignment) of activities of different players**
- **Facilitate the exchange of freight between players**
  
- **Potential is huge, but lessons learned from past experience: keep business models in mind:**
  - **INTIS (Netherlands, aimed at setting standards)**
  - **Barcelona Port Community System**
  - **Dutch government single window initiatives**

# Examples of ICT in line with business models

- **Portbase**, owned by the port authorities with an incentive to invest. Financing partially indirectly, from port dues and land rents. Necessary because a business model purely based on direct financing through user charges is not possible, given the free riding, unequal distribution of costs and benefits etc.
- **Key-rail**, with infrastructure charges as principal revenue stream has a clear incentive to invest in coordination: this improves the overall rail product and capacity utilisation.
- **Planning Apart Together**, to ensure both autonomy and coordination.

# Conclusions

- **Business models impact viability of ICT systems**
- **Often need for organisations with other revenue streams than the ICT system itself.**
- **Opportunities for distributed planning (planning apart together)**
- **Many hurdles still need to be taken!**
  - **Seaport & inland nodes**
  - **Empty containers**
  - **...**
- **Smart government policies for B to G transactions required**