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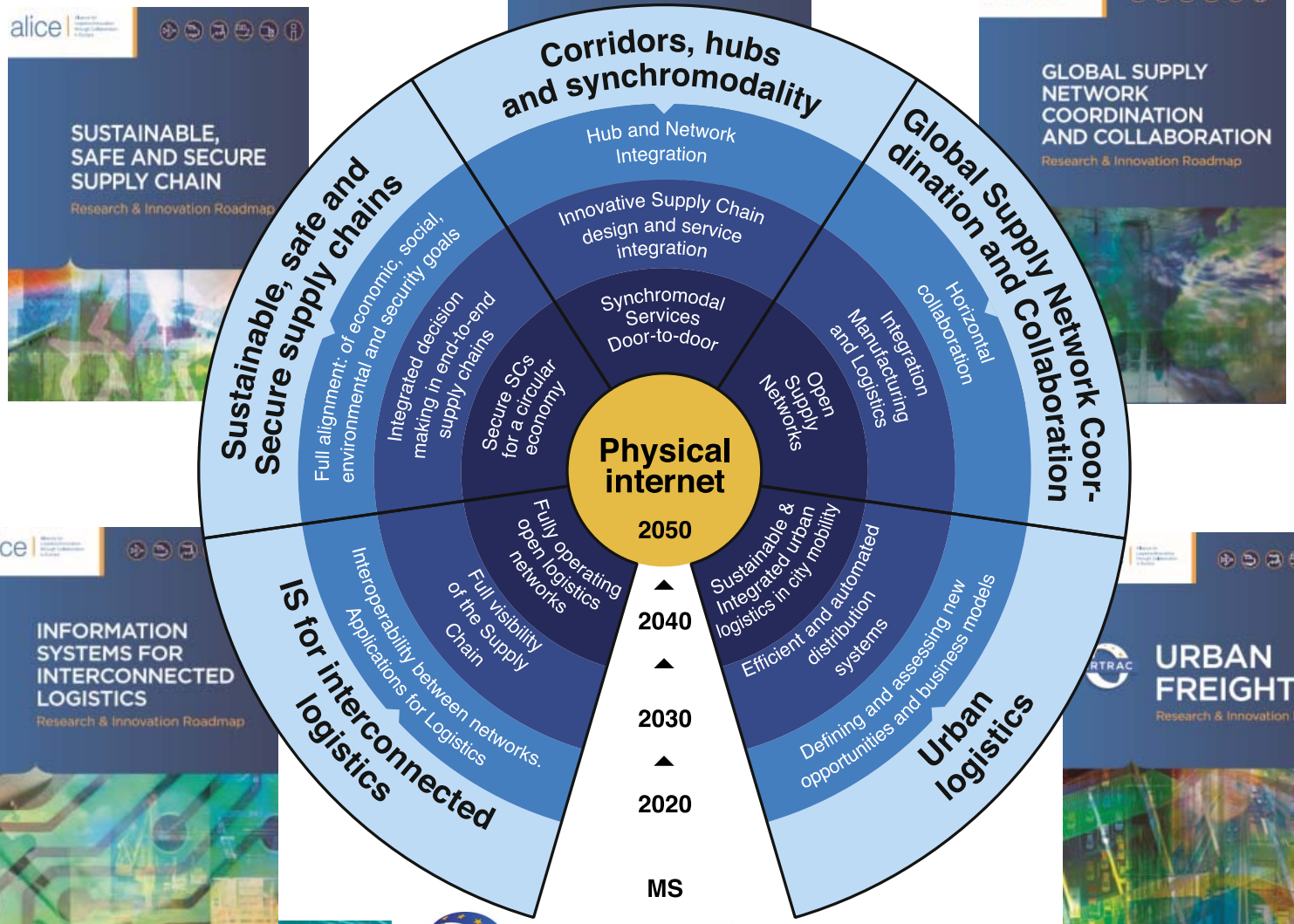
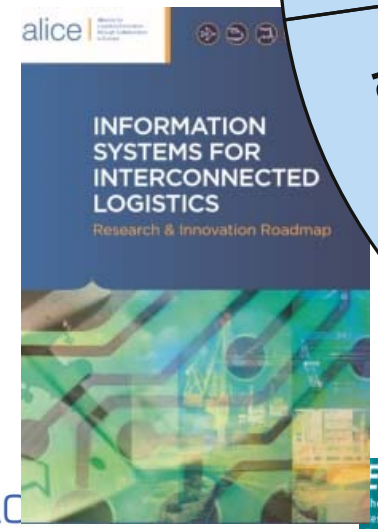
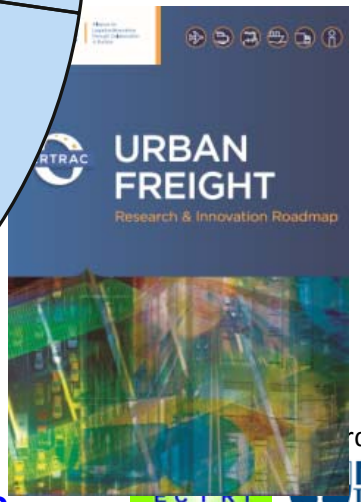
Alliance for Logistics Innovation through Collaboration in Europe

Surv… http://www.etp-logistics.eu/?page_id=849

Roadmaps







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Coordinated by: Newcastle University

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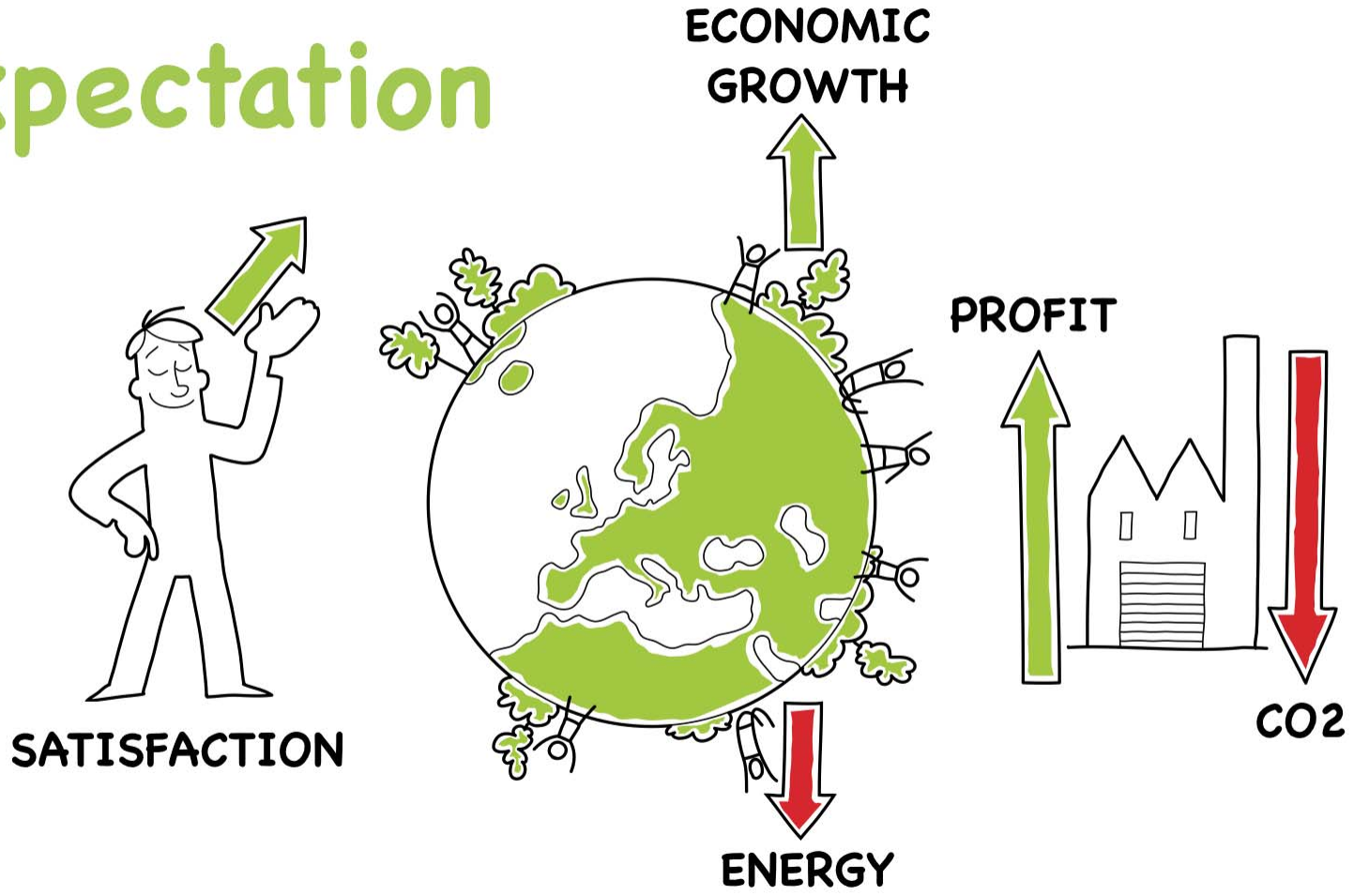
Expectation



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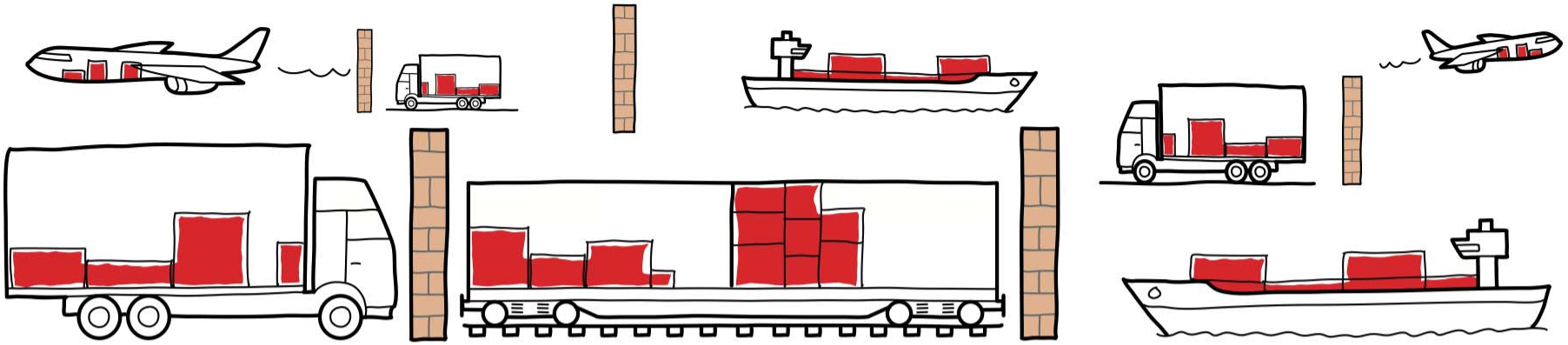
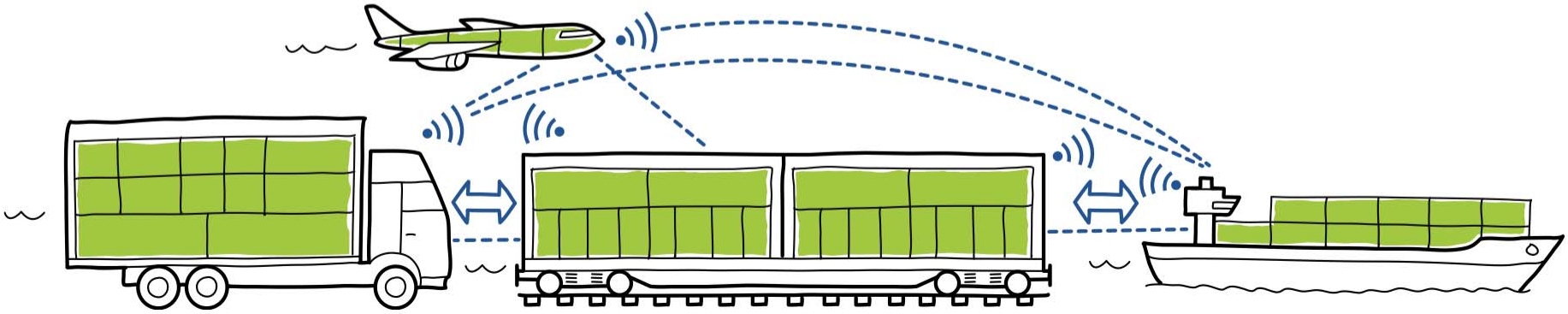


Challenge



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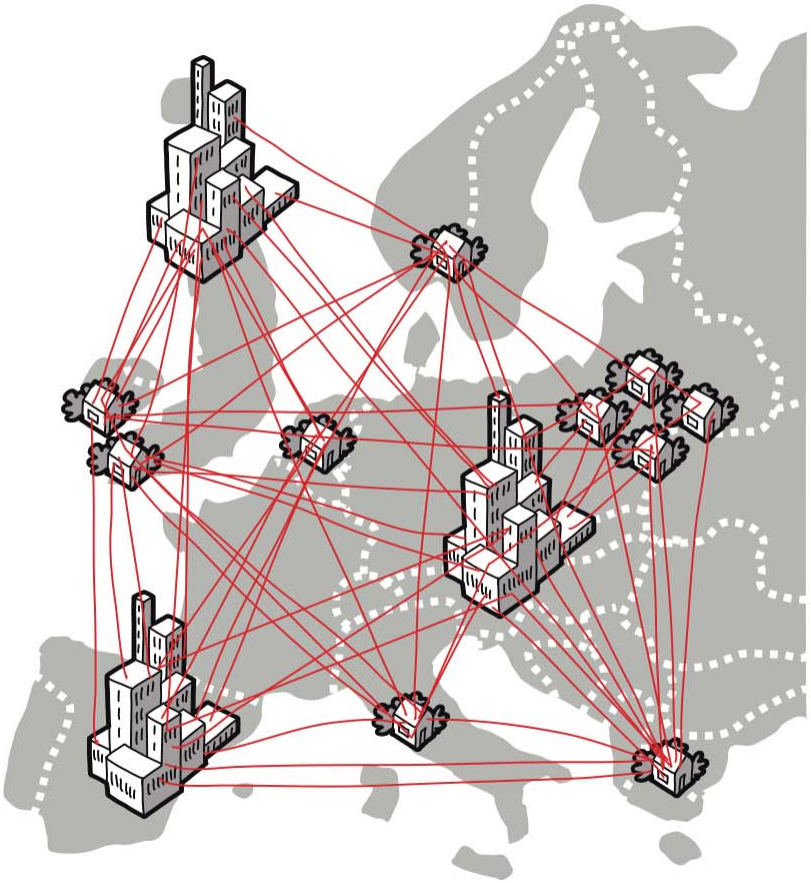
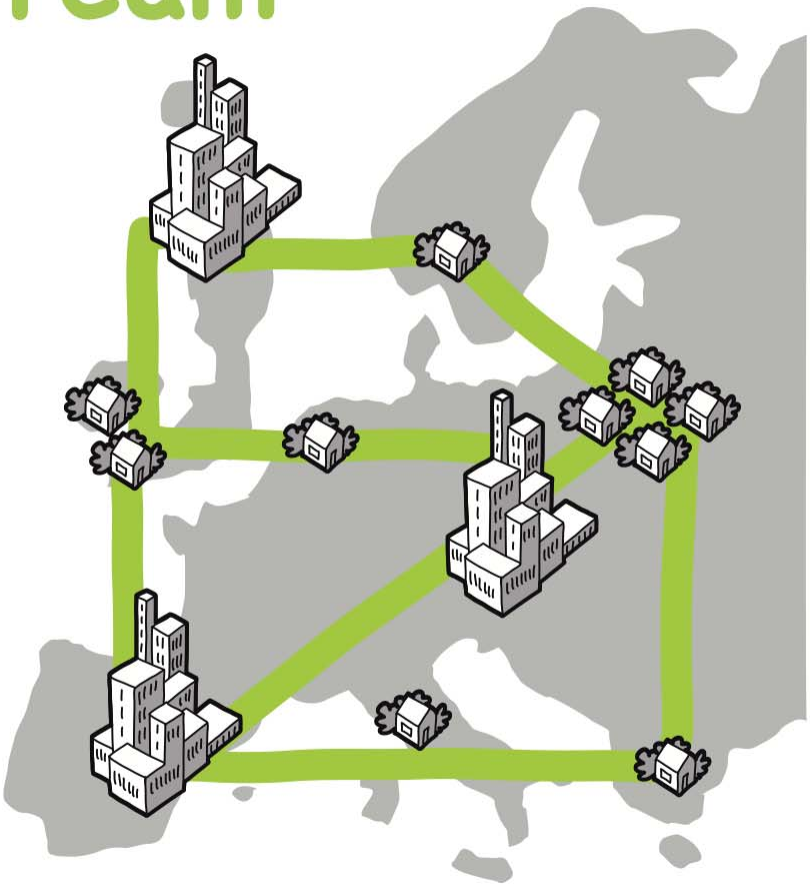
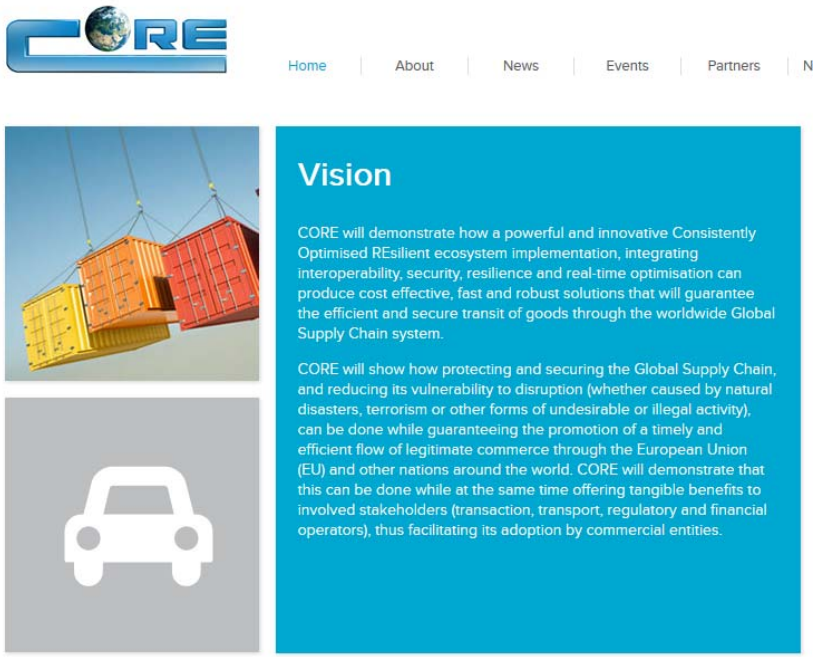
Dream





Running Projects: ***Sustainable Safe and Secure Supply Chains***



Consistently Optimised Resilient Secure Global Supply-Chains

http://www.coreproject.eu/

NEW Project starting in September 2016!!!!:

Promoting the deployment of green transport, towards Eco-labels for logistics

ACARE alice Alliance for Logistics Innovation through Collaboration in Europe ERRAC The European Rail Research Advisory Council ERTRAC WATERBORNE TP

SETRIS Project coordinated by:

ECTRI Newcastle University

Running Projects: ***Corridors Hubs and Synchromodality***

Synchro-modal Supply Chain Eco-Net

http://www.synchronet.eu/

Smart Supply Chain Oriented Rail Freight Services

www.smartrail-project.eu

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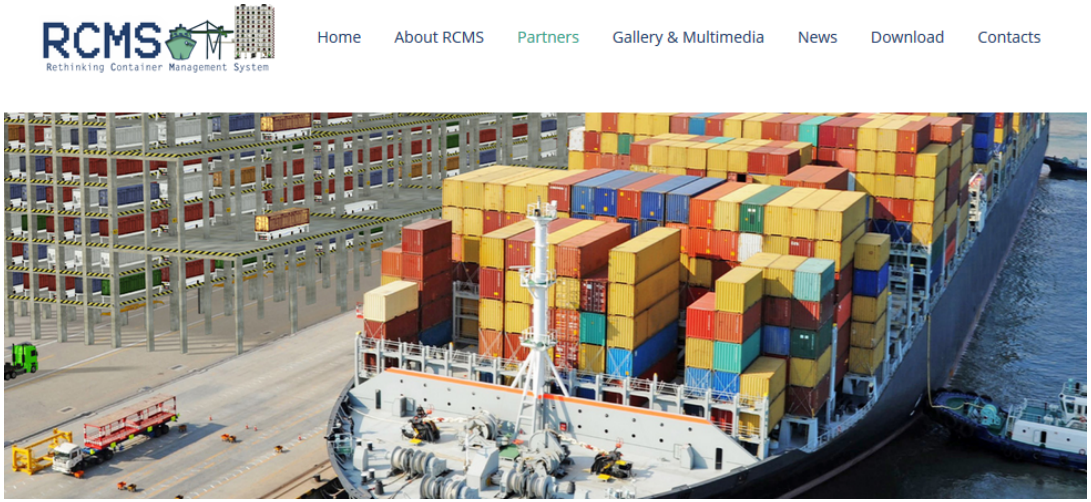


Rethinking Container Management Systems

http://www.rcms-project.net/

2 New projects starting in September 2017!!!

Topic: Networked and efficient logistics clusters

SETRIS Project coordinated by:

Running Projects: ***Information Systems for Interconnected Logistics***

2 New projects starting in September 2016!!!

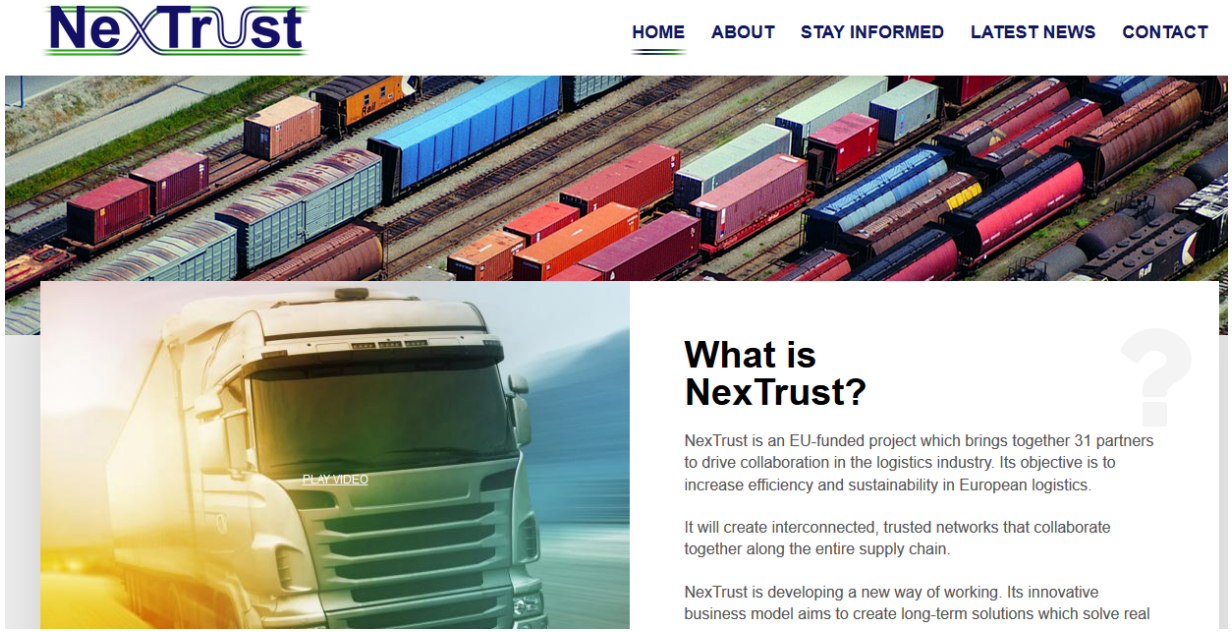
AEOLIX & SELIS

Common communication and navigation platforms for pan-European logistics application

SETRIS Project coordinated by:

Running Projects: ***Global Supply Network Coordination and collaboration***

NEXTRUST, Building sustainable logistics through trusted collaborative networks across the entire supply chain http://nextrust-project.eu/



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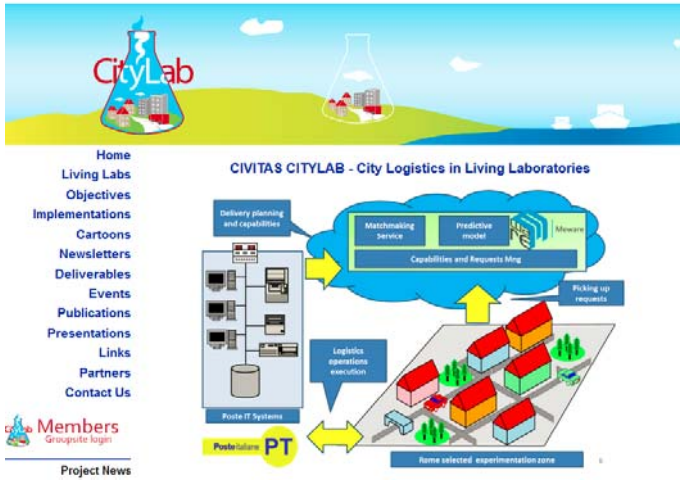
Running Projects: Urban Logistics

novelog http://novelog.eu/

http://www.citylab-project.eu/



http://www.success-urbanlogistics.eu/

http://www.u-turn-project.eu/

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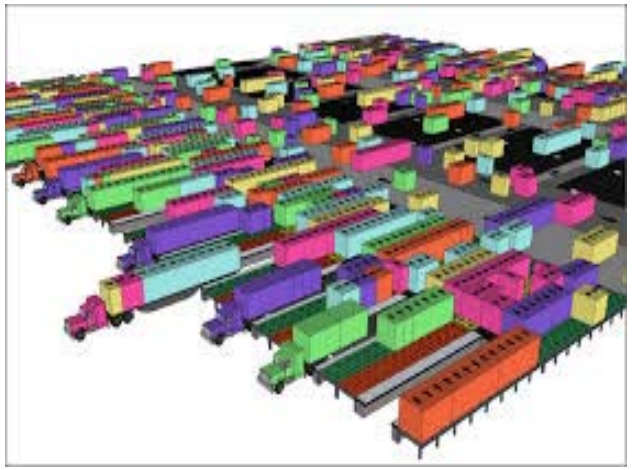
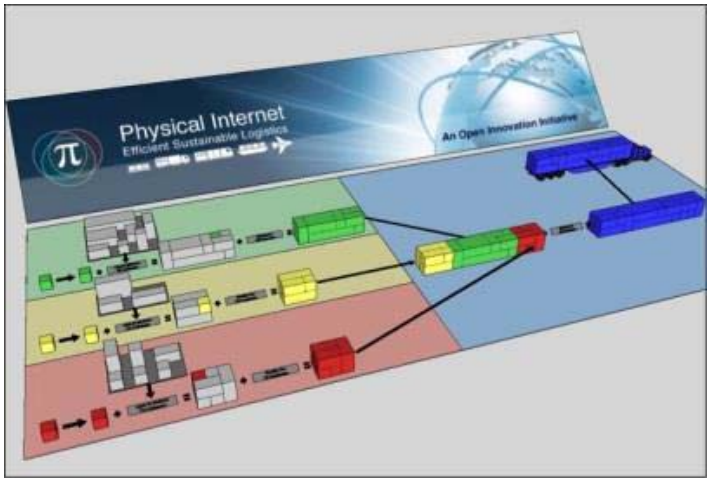
In 2018, 2 new projects:

MG.5.4. 2017 Potential of the Physical Internet





http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2096-mg-5.4-2017.html

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SETRIS consortium

DLR EUROCONTROL	CO-TREE Fraunhofer IML CNC-LOGISTICA DINALOG ILiM	UIC UITP UNIFE	FEHRL AVL POLIS	BMT SEA EU TNO	Newcastle University ECTRI

ACARE | ALICE | ERRAC | ERTRAC | waterborne | research community





EUROPEAN TECHNOLOGY PLATFORMS

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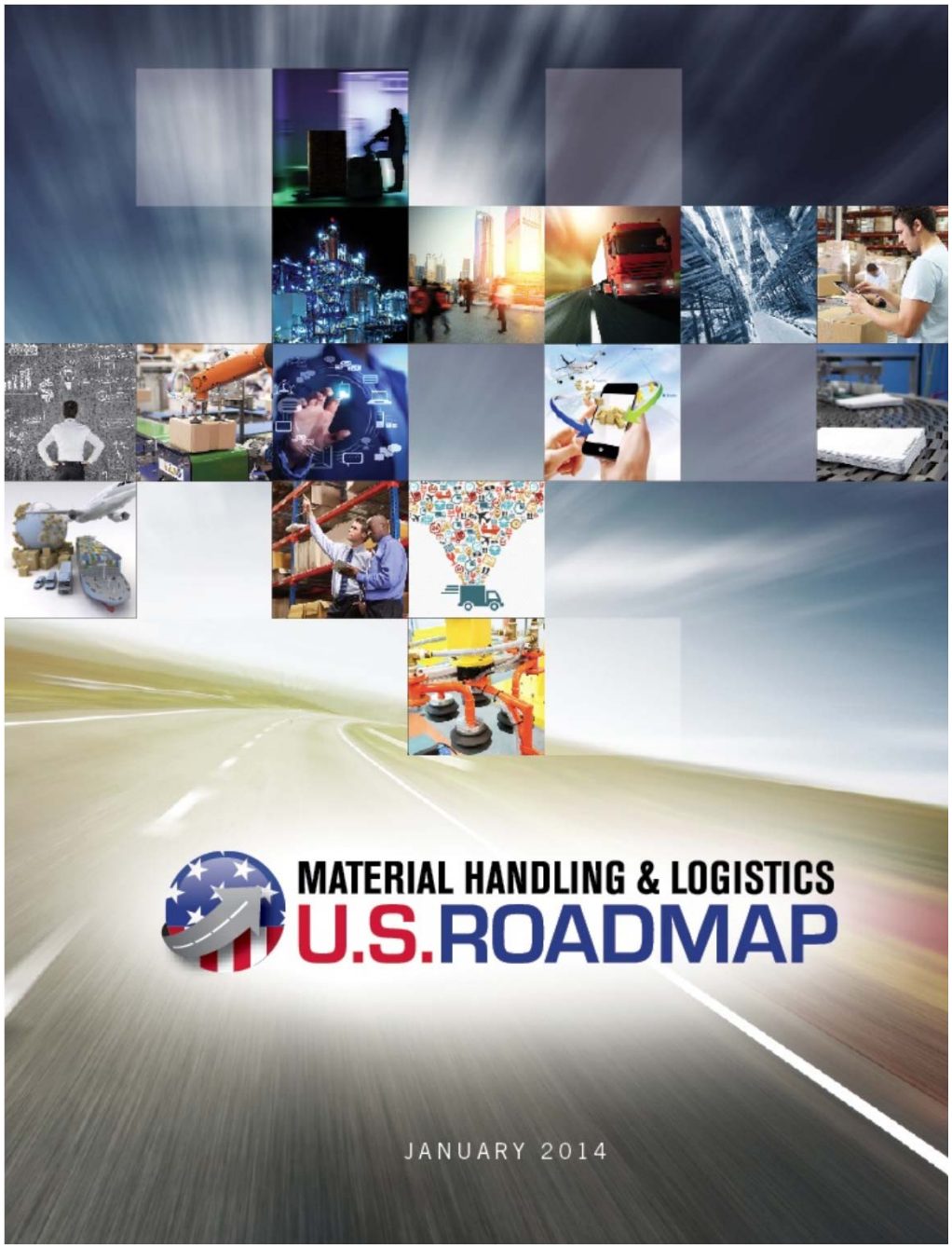

MATERIAL HANDLING & LOGISTICS
U.S. ROADMAP

JANUARY 2014

Participants

- 45 suppliers
- 22 users
- 20 academics
- 12 associations/publishers
- 5 government

Trends

- E-commerce
- Relentless competition
- Mass personalization
- Urbanization
- Mobile and Wearable Computing
- Robotics and Automation
- Sensors and the IoT
- Big Data
- Changing Workforce
- Sustainability

Needed Capabilities

- Total Supply Chain Visibility
- Standardization
- Sensors and IoT
- Planning and Optimization
- Omni-Channel Fulfillment
- High-Speed Delivery
- Collaboration
- Urban Logistics
- Technology and Automation
- Workforce

Lessons learned

- We cast a wide net.
- We chose a timeframe that defused competitive instincts.
- We have been pretty effective in after-event promotion.

- We did not write a roadmap.
- We did not adequately prepare attendees.
- We did not create enough lead time to get the right people.

Lessons learned in Louisville

- Develop a concise, compelling story.
- Choose your champions wisely.
- Acknowledge the politics, then try to find a way for everyone to win.
- Don’t try to boil the ocean.

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IPIC 2016

Modulushca 2030 Roadmap

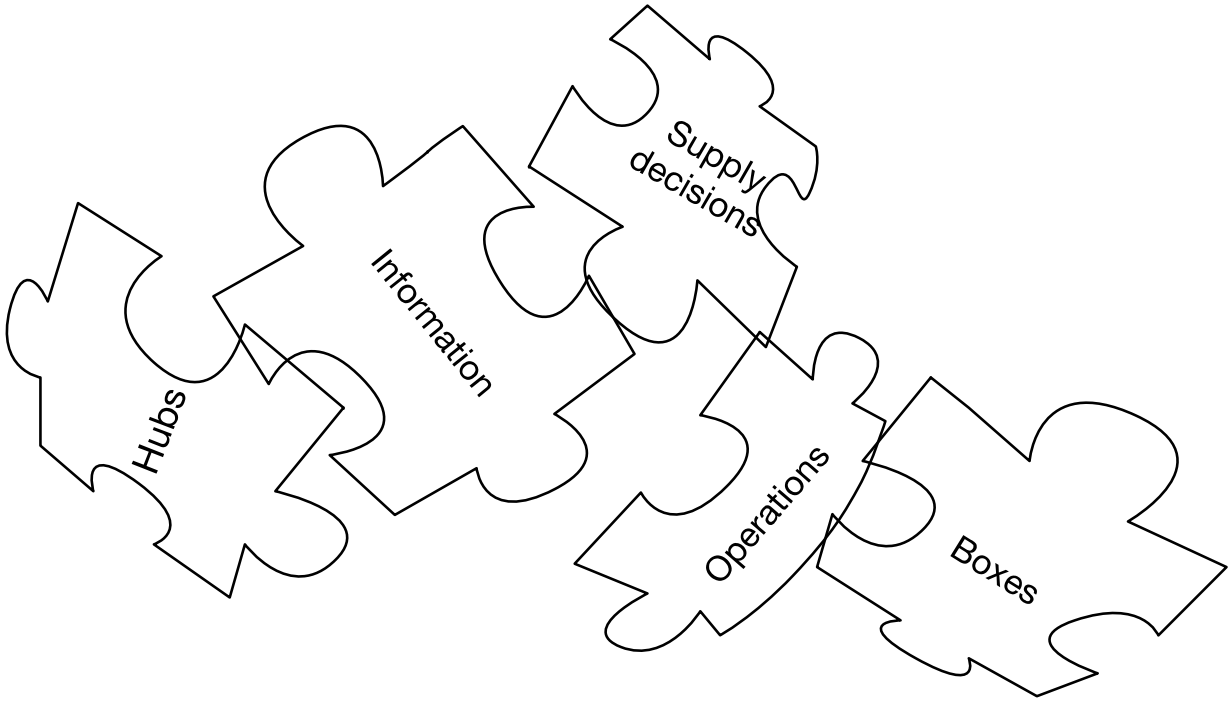
Eric Ballot – Mines ParisTech PSL Research University

Towards a smart hyperconnected era of efficient and sustainable logistics, supply chains and transportation

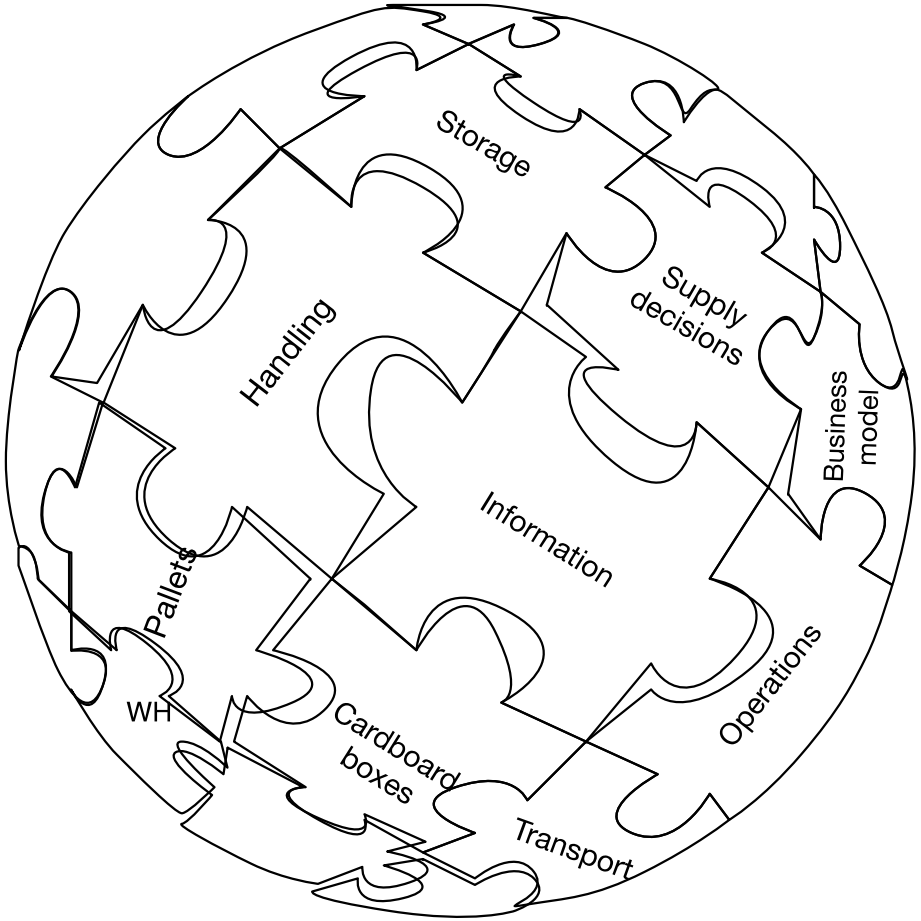
IPIC 2016 - 3rd International Physical Internet Conference

June 29-July 1, 2016 | Atlanta, GA USA

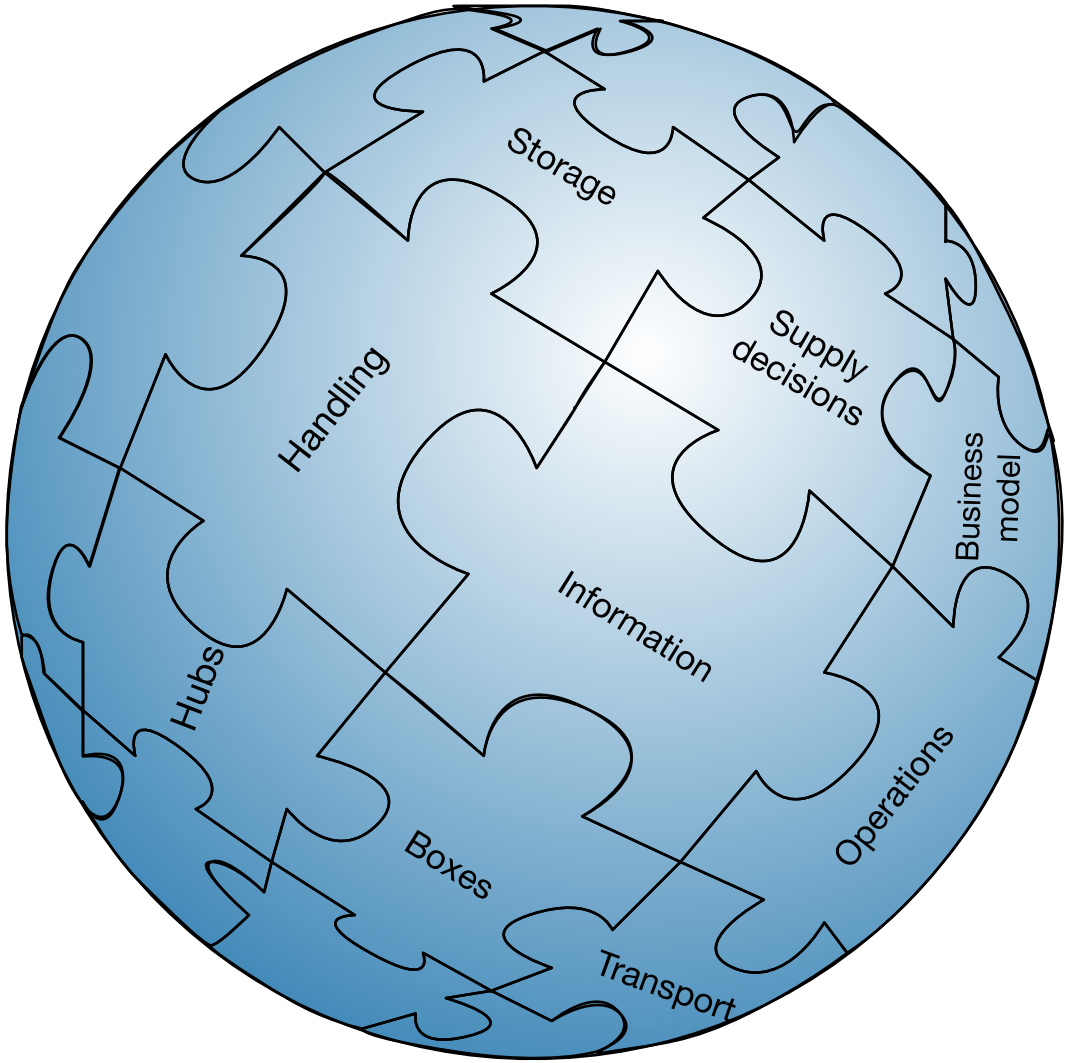
Logistics is made of many components



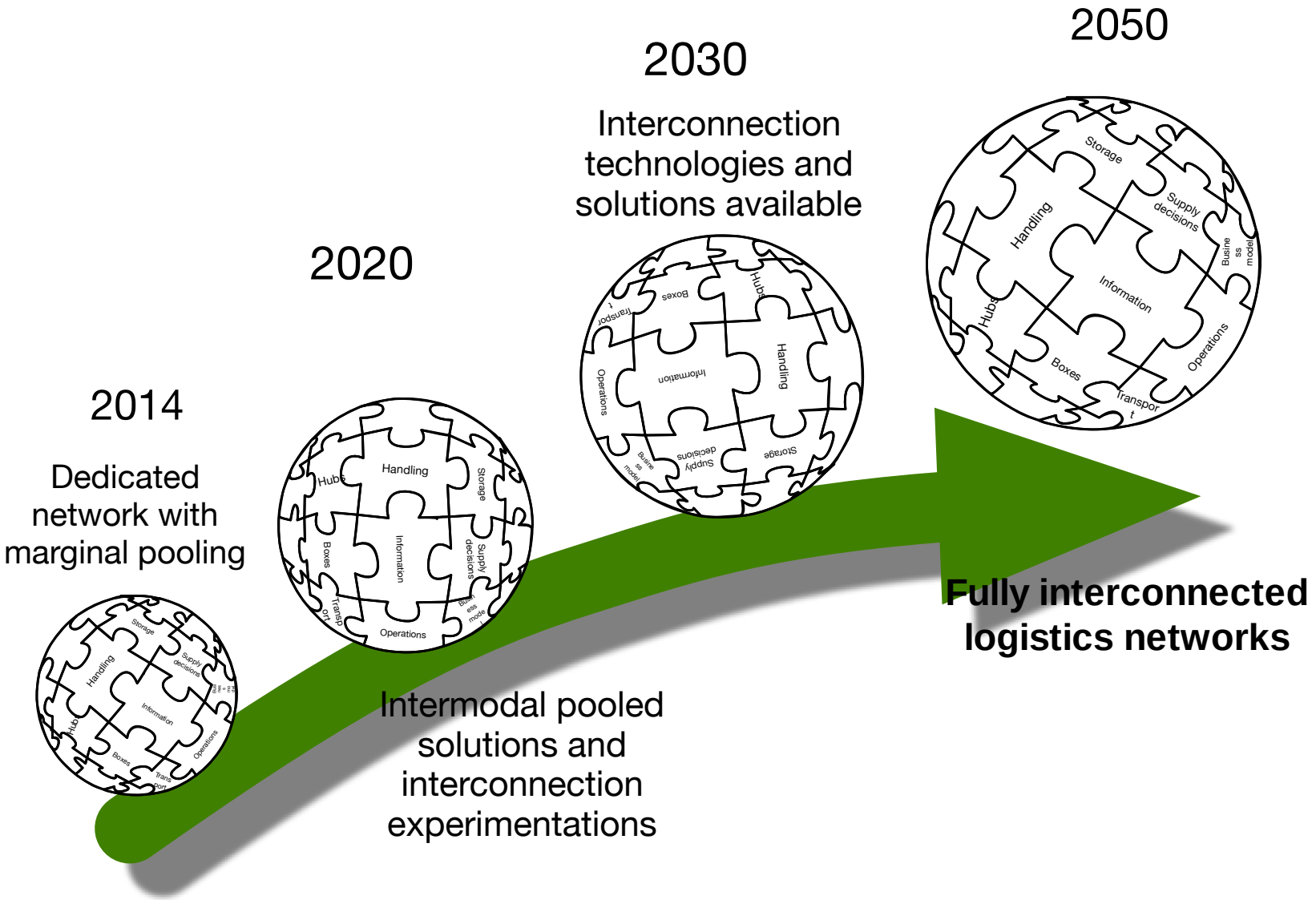
Logistics is made of many **linked** components to form an ecosystem



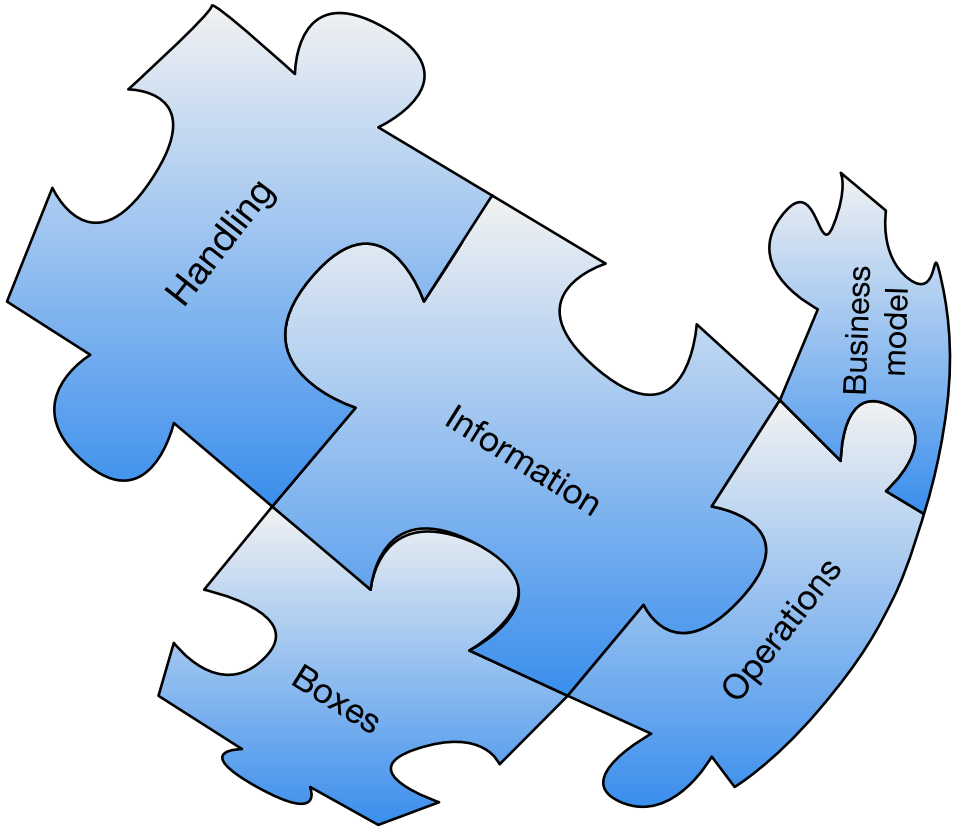
The Physical Internet is a proposal to change the logistics ecosystem



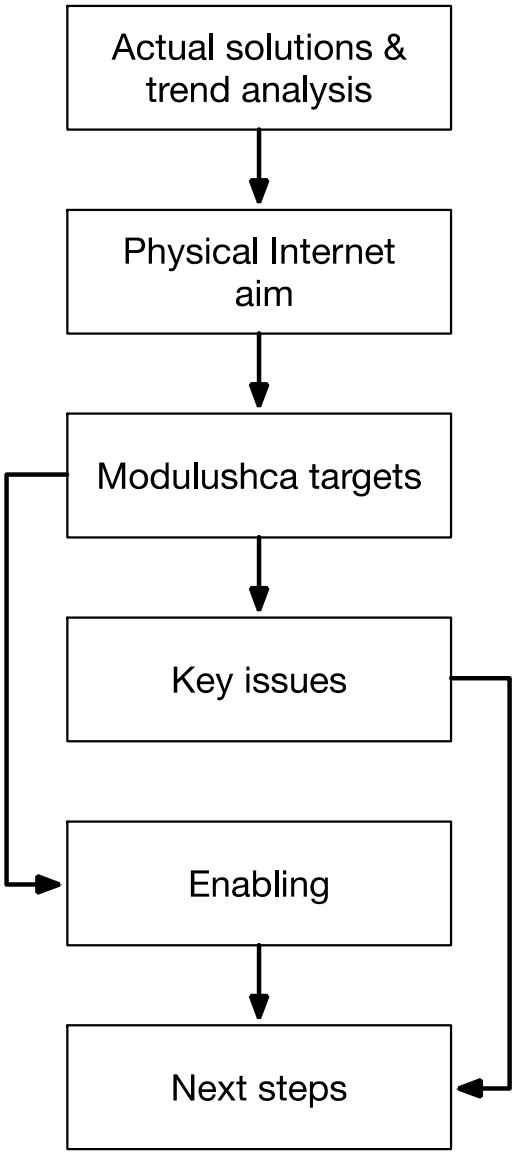
The Modulushca roadmap and phases



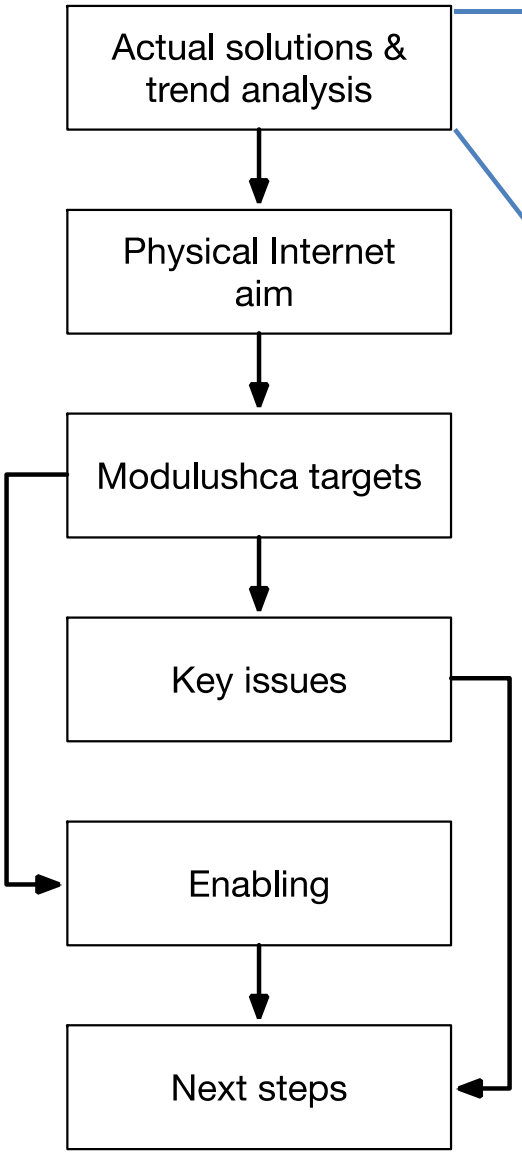
The focus in the Modulushca roadmap for FMCG only



Methodology

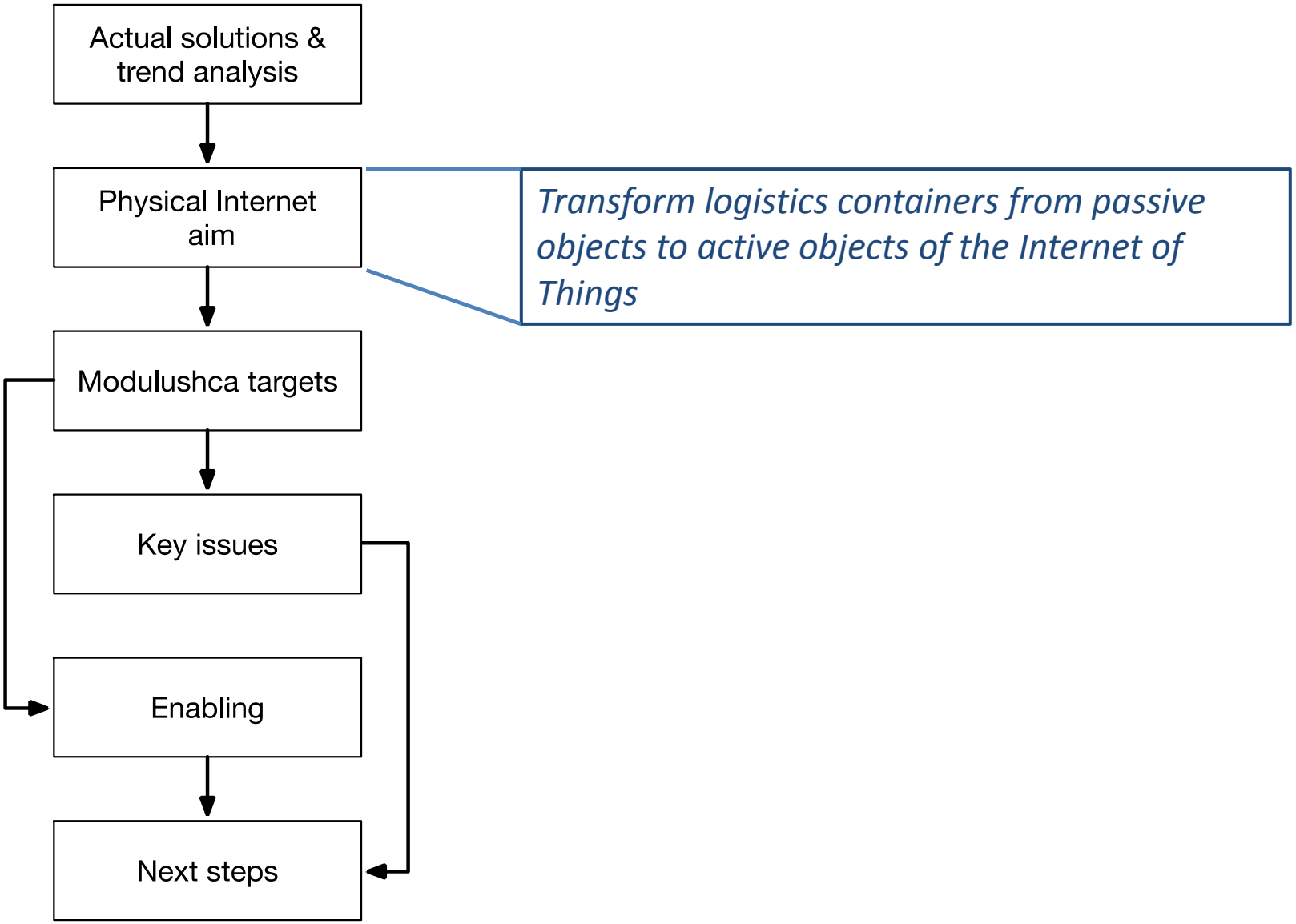


Methodology: illustrated by the digital interconnectivity

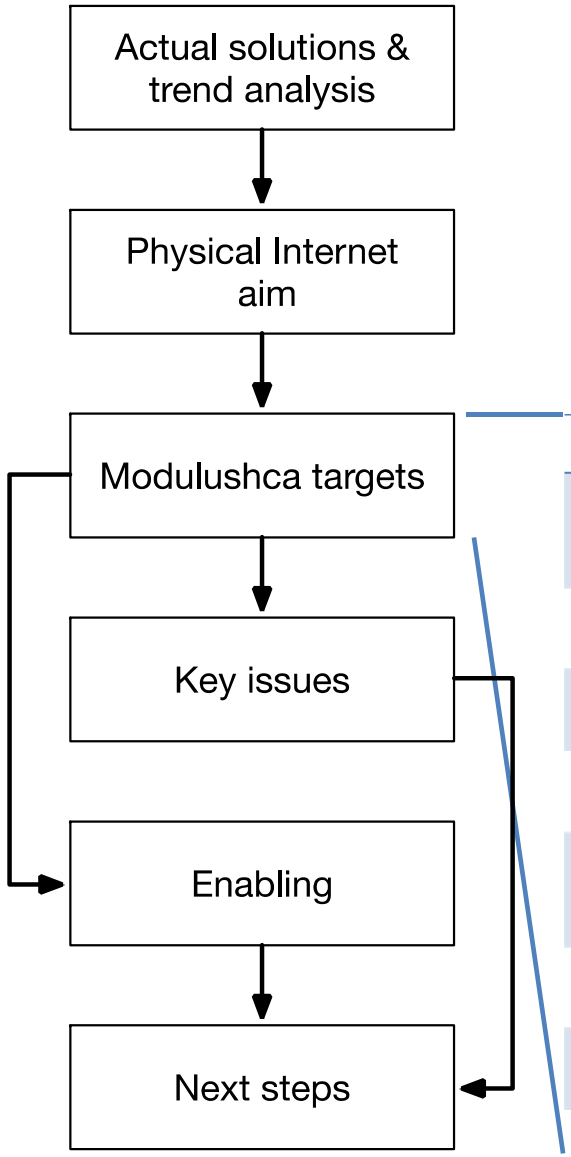


- Dematerialization of logistics documents
- From passive to active objects (Internet of Things, IoT)
- From dedicated to standard codifications.
- From proprietary systems to cloud and web services.

Methodology: illustrated by the digital interconnectivity

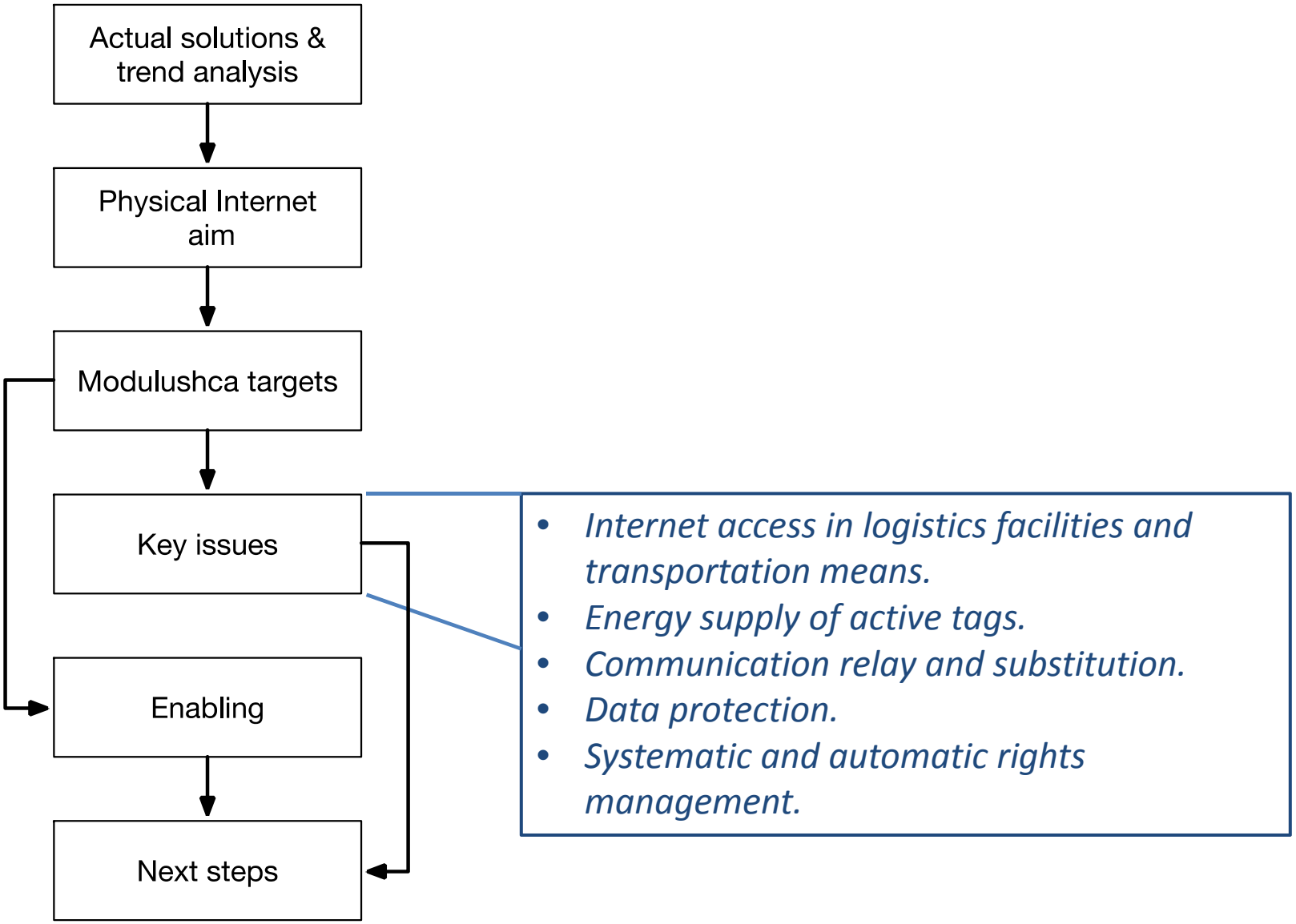


Methodology: illustrated by the digital interconnectivity



Function	Actual solution	2030 target	Enabling
Product identification	Bar code	Bar code, Smart product, Through container	Container with anonymous product(s) inside
Shipment identification	SSCC bar code or RFID tag	Active tag	Data record & storage
Information capture	When scanned Read only	When connected Read and write	Query, almost real time status and update
Information nature	Product code or shipment code	Container unique id. linked to content	Full traceability when access granted
Information structure	Code for internal use	Standard context-rich: history, location	Communication management among stakeholders
Information storage	Company-dedicated information system	Container itself with a copy in the cloud	Access from all appropriate stakeholders
Info communication	EDI	EPCIS and Internet (of Things)	Direct Machine to Machine communication
Information processing	Centralized	Distributed	Market product deployment

Methodology: illustrated by the digital interconnectivity



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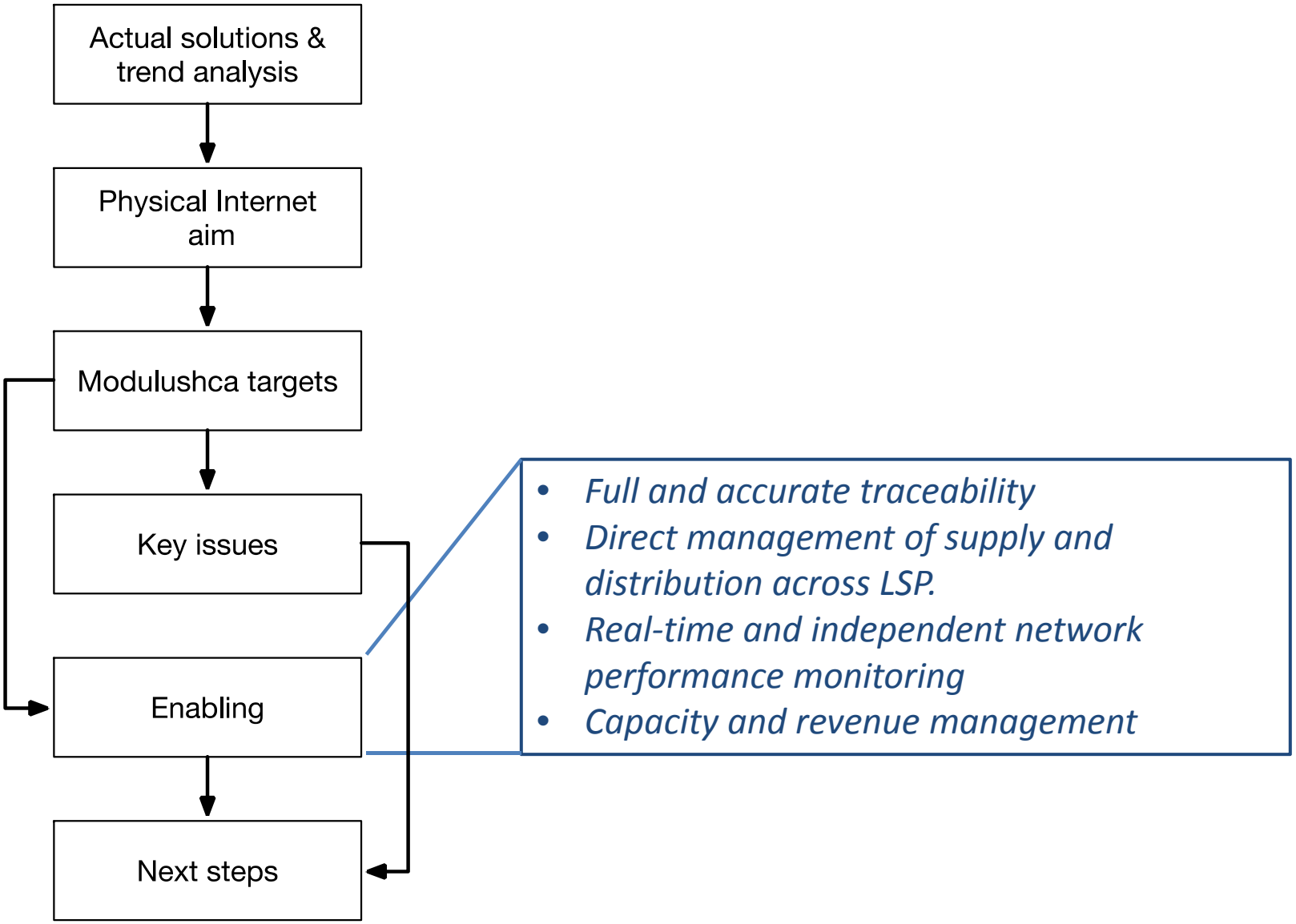
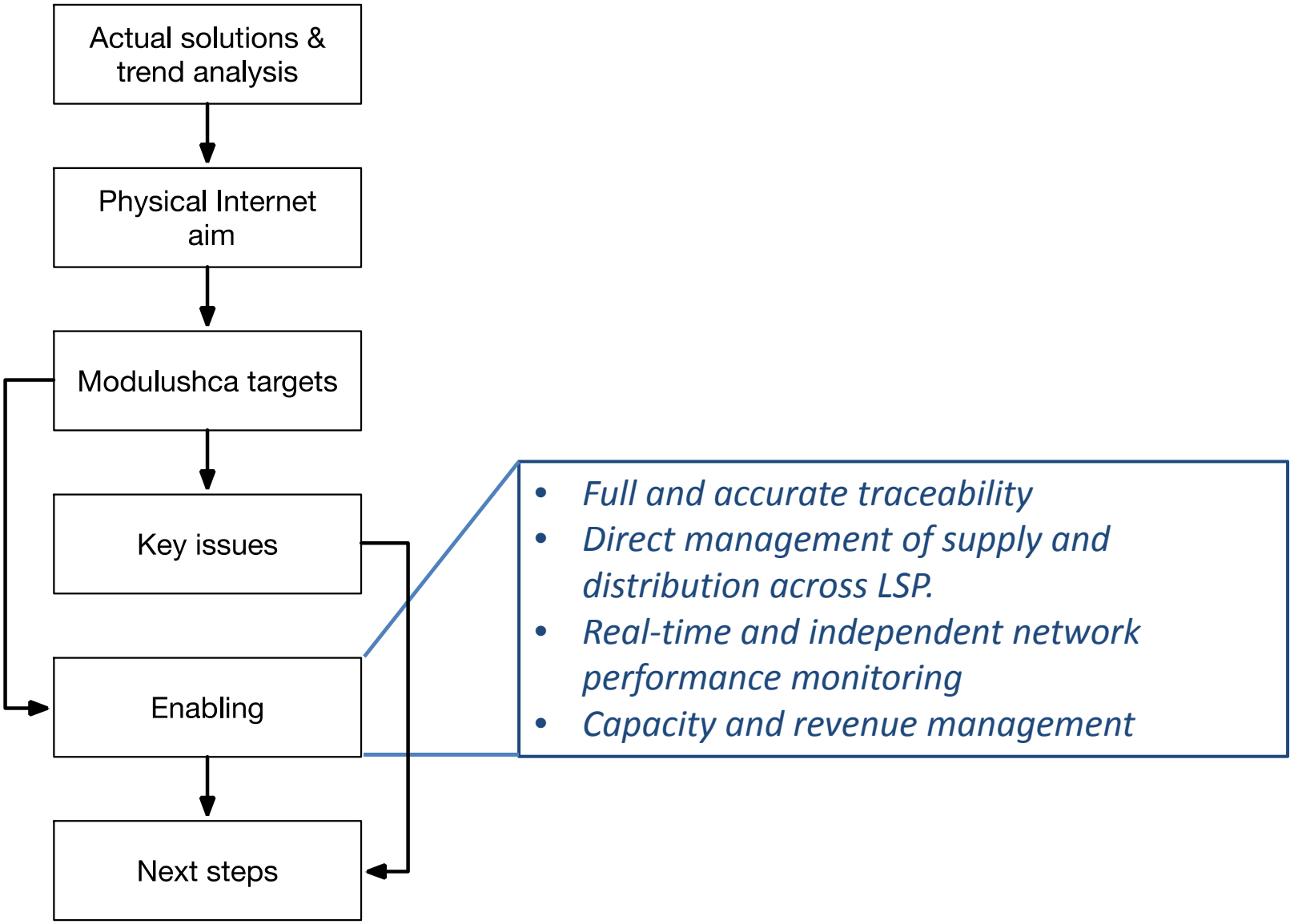
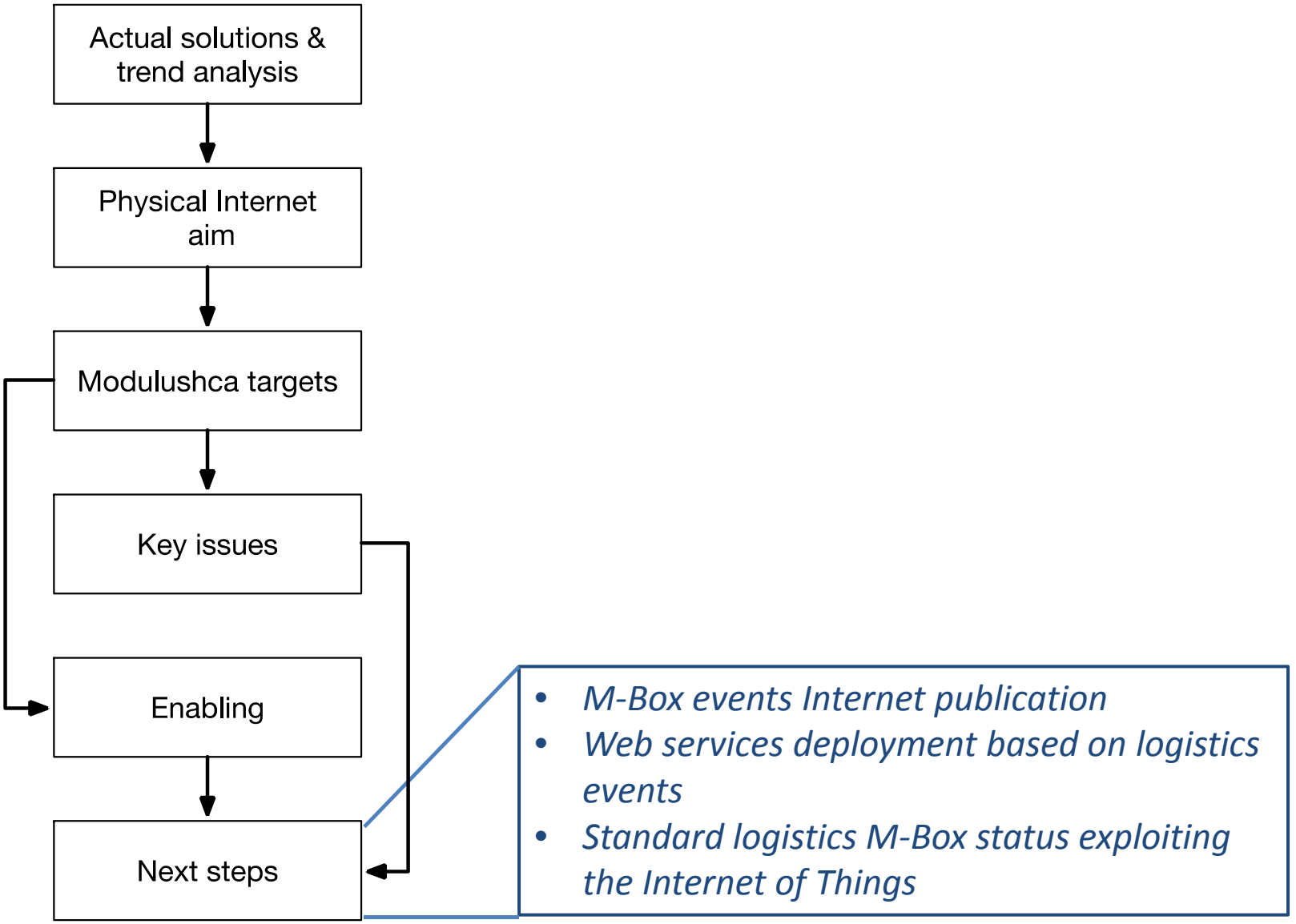


Methodology: illustrated by the digital interconnectivity



Methodology: illustrated by the digital interconnectivity



Building blocks towards FMCG-PI: Physical Interconnectivity

Function	Actual solution	2030 target	Enabling
Product protection	Cardboard layers Some returnable totes	M-Box	Container with anonymous product(s) inside
Modularity	Company specific solutions, some supply chain solutions	PI-containers, including M-Box	Cube fill
Interlocking	Film wrap	M-Box	Automated coupling/ decoupling
Handling	Preferred: pallets When needed: cases/totes	M-Box	Efficient pallet free handling, weight & volume saved
Picking	Forklift and manual	Automated sorters	Composition / decomposition of M-Box
Loading/unloading of transport means	Forklift and manual	Roller-type technology	Quick operations
Transshipment	Cross-dock Sorting yard	PI-hubs Multimodal-easy	Efficient transit between services
Standardization	Too many non-cross-fitting standards, history-loaded & customization-intensive	Standard set of sizes, strengths & couplers	Interconnectivity across companies and modes

Building blocks towards FMCG-PI: Operations Interconnectivity

Function	Actual solution	2030 target	Enabling
Transportation	Dominancy of semi-trailer	Modular container carrying vehicles (including semi-trailers & other modes)	Modular anonymous product containerization
Storage	In a dedicated warehouse or DC	Dynamic deployment of stock in multiple open DCs	Less stock and shorter delivery lead time of FMCG
Logistic operations	Outsourced to 3PL	Subcontracted to many LSP	Dynamic assembly of best solutions available
Route to market	Regular unimodal service	Dynamic multimodal routes	Dynamic adaptation of supply network
Planning	Centralized, reactive, without alternative	Decentralized, proactive, with multiple options	Better service level at lower cost (reduced footprint and more sustainable)
Performance assessment	ERP KPIs with many lacks and biases, mostly confidential	Public service performance reports using cloud objects	More accurate and actor independent reporting enabling fact-based decision
Certification	Few	A must	Exchange and liability

Building blocks towards FMCG-PI: Business Interconnectivity

Function	Actual solution	2030 target	Enabling
Shared services	Collaborative pooling	Open pooling, Dynamic allocation	Better service, efficiency and revenues
Traffic exchange	One to one agreement	Generalization	More efficient end-to-end process
Revenue distribution	Proportional or Shapley Value when sharing	Dynamic pricing and/or auction	Better allocation, enhancing willingness to interconnect
Buy	Shipper or receiver	Shipper and receiver	Service improvement
Inventory ownership	By all stakeholders, protecting from each other	Novel models exploiting interconnectivity	Inventory reduction, multi-client and multi-supplier economies
Liability assessment & protection	Straightforward for single provider, Well delineated for bilateral relationships	Simple, fair & efficient for multi-provider services	Trust and risk reduction in interconnected logistics
Certification	Multiple, disconnected, limited impact	Mandatory PI-certification	Insuring and elevating the interconnectivity capabilities
Interconnected services (new)	Embryonic and few	Numerous, highly value adding	Personalized home delivery, Interconnected crowdsourced delivery, etc.
Governance	Company centric	Physical Internet governance	Planned, fair, visionary and pragmatic PI evolution

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Survey:

Chapter 1: **Components & Technical developments needed to achieve PI implementation**

Chapter 2: **Transition Management: business models, regulations and governance**

Chapter 3: **Expected Impacts of Physical Internet realization**

Chapter 4: **Barriers, Opportunities/Triggers and Infrastructural Investments for PI**

Please respond on-line through the link:

http://www.etp-logistics.eu/?page_id=849

The survey is also available in word format for your convenience!!!

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Chapter 1: **Components, technologies and standards**

- Components
- Transition Management
- Impacts
- Design:
  - Network
  - Nodes
- Infrastructure:
  - Transhipment
  - ICT
- Standardization:
  - Modular Units
  - Protocols
- Management Systems:
  - PI Network
  - PI Nodes
- Integration with people Mobility
- Skills and Education
- Business Models
- Governance
- Regulations
- **Energy**
- **Cost**
- **Emissions**

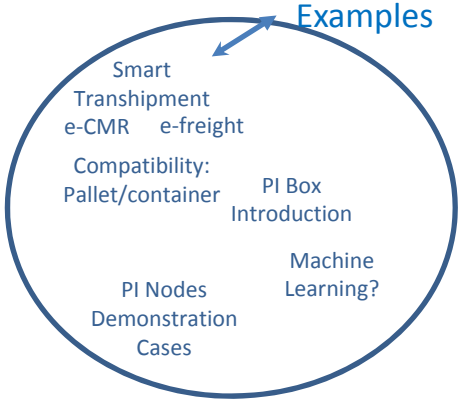
*Milestones

Phase 1:
- **Isolated local Business Cases**

Phase 2:
- **Number of local Isolated Business**
- **PI Networks at National Scale**

Phase 3:
- **Extended Business Cases**
- **PI Networks working at National/European Scale**
- **Cross-sectorial utilization of PI**

Examples



Questions:

- Which components/technologies need to be developed to reach full PI?. Short explanation of the component ant the relevance of it.
- Time frame needed to develop the component?
- Are these components falling in which area: Design, Infrastructure, Standardization… OTHER?

2020	2030	2040	2050
-10 %	-20 %	-30 %	
-5 %	-10 %	-15 %	
-10 %	-25 %	-40 %	

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Chapter 1: **Components, technologies and Standards, some answers**

- ✓ **Artificial intelligence** algorithms/heuristics and systems for **dynamic decision making** necessary to **optimize the flow of goods without human intervention**
- ✓ **Modular smart containers, boxes**
- ✓ **Neutral 3rd party organizations** to oversee data flow, security, pricing, etc.
- ✓ Means of governance so that **transactions and goods can flow without human intervention.**
- ✓ Network management system: booking systems, market places, advanced tracking technologies, standards that identify each object…
- ✓ **Smart Manufacturiing and packaging**: linking the end-user to industry 4.0 paradigm and industrial data space
- ✓ **Handling technology** is a key success factor to reduce the cost to pass through a hub and increase the efficiency of the network, equipment to move and store modular smart PI containers
- ✓ **Analytics** to support stocking of same-day delivery storage points - similar to Amazon Prime

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Chapter 2: **Transition management and Impact**

- Components
- Transition Management
- Impacts

*Milestones

- Design:
  - Network
  - Nodes
- Infrastructure:
  - Transhipment
  - ICT
- Standardization:
  - Modular Units
  - Protocols
- Management Systems:
  - PI Network
  - PI Nodes
- Integration with people Mobility
- Skills and Education
- Business Models
- Governance
- Regulations
- **Energy**
- **Cost**
- **Emissions**

Phase 1:
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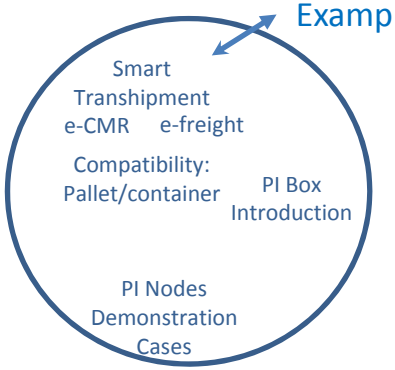
Examples



2020 2030 2040 2050

Questions:

- Which aspects are needed to manage transition within this/other categories?
- Which impacts do you foresee/expect?. Do you have examples on potential impacts?

2020	2030	2040
-10 %	-20 %	-30 %
-5 %	-10 %	-15 %
-10 %	-25 %	-40 %

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Chapter 2: **Transition management**

- ✓ **Openness** for **distributed models as opposed to proprietary ones**, ability and desire to **collaborate and share**, transformation of business models from pure **competition to "coopetition"**…
- ✓ **Non repudiation methods** to detect and **blacklist bad actors (counterfeiters, etc.)** - similar to spam filters
- ✓ **Anti competition Regulations considerations**
- ✓ We will need people with **more technical skills**: automation design and maintenance, IT, analytics, etc and with all kind of networks experiences. Who grow up with GAFA.
- ✓ Distributed payment and **value sharing**
- ✓ Experimentations and **start-ups** like Flexe, and others that will prove feasibility, **thus real business models**, as well as pull technologies and regulations.
- ✓ **Risk Management, legal and insurance**…
- ✓ ….

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Plenary Forum FB: ***Roadmapping Our Way Toward Achieving The Physical Internet Vision*.**

Prof. Kevin Gue, LoDI Director; Duthie Chair of Engineering Logistics, U. Louisville, USA

Prof. Eric Ballot, Mines ParisTech, France

Prof. Benoit Montreuil, Director, Physical Internet Center and Supply Chain & Logistics Institute, Georgia Tech, USA

Sergio Barbarino, Supply Network Innovation Center, Procter & Gamble, Belgium

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Chapter 3: **Expected Impacts of Physical Internet realization**

- **Emissions**
- **Energy**
- **Cost.**
- **Others:**
  - Enhanced productivity and profitability via new business models and offerings.
  - Increased level of service
  - Positive image.

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Chapter 4: **Barriers, Opportunities/Triggers and Infrastructural investments**

Barriers:

- ✓ New paradigm will leave winners and losers → **Conservative position in the sector.**
- ✓ **Data Sharing and Cyber Security.**
- ✓ Uncertainty on **governance models.**
- ✓ **Role of Government's** and their control over PI.
- ✓ **Financing of required Infrastructure**

Triggers and Enabler:

- ✓ **Societal push** on **environmental, congestion, energy** challenges
- ✓ **Digitalization**
- ✓ **Demonstration of Strong Business Cases.**
- ✓ **Easy Life**: Robust processes, increase resiliency flexibility , schedule and execution.
- ✓ Reconciliation of **people needs vs Sustainability**→ Instant consumption vs efficiency and emissions. Not anymore a trade of with PI.
- ✓ Increased **collaboration** and social economy: crowdsourcing.
- ✓ New sources of **market competition** may promote fast implementation**.**
- ✓ Proper **communication** of the benefits of Physical Internet concept.
- ✓ **Endorsement by authorities.**
- ✓ **Current public investments** supporting PI leveraging tangible benefits: CEF, GALILEO, IoT, ITS and savings in future investments due to better asset utilization

Infrastructure and Investments:

- ✓ Infrastructure paid by public: **Connecting Europe Facility (EU), Urban Consolidation Centres (Cities)**
- ✓ **Interfaces and Standards** need to be built by Private, also some IT infrastructure.
- ✓ **Users paying per use**
- ✓ **Public Investment monitoring**
- ✓ **Intermodal hubs organization and Standardization**

Mechanisms:

- ✓ **Public-private partnerships.**
- ✓ **Private Business Cases demonstrating value to public.**

Remaining Questions:

- ✓ **Could Galileo be used?**
- ✓ **Role of military and environmental policy?**
- ✓ **Do we have the right TEN-T network relevance/ sufficiency**

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Survey: http://www.etp-logistics.eu/?page_id=849

Chapter 4: **Barriers, Opportunities/Triggers and Infrastructural investments**

- What are the barriers to achieve PI?
- What are the triggers and enablers for the different stakeholders in respect of PI?
- Which infrastructural investments are needed to achieve PI? Who: public or Private and which mechanisms may be used?

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SETRIS/ALICE workshops in IPIC2016

Atlanta, 29th of June – 1st of July 2016

Research and Innovation roadmap on the Physical Internet

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