

SMART Logistics Partnership



CONTAI – MCG – CC-Mobility – FixLog

**SLP-alliance is a member of
setting the roadmap for the Physical Internet**



***SMART Interoperable Logistics Solutions
across Supply Chain Segments & Transport Modes***

interoperable • compatible • connected

maritime containers rationalised global trade & shipping but did not envision current e-commerce & mega-cities



Ocean Containers **DO NOT** belong in densely populated cities & urban areas.
Modular, connectable & cross-compatible PODs & μ (micro)-containers should be the norm for *hinterland multimodal transportation modes*

- with **fit-4-urpuse** vehicles
- enabling both **FTL & LTL**
- reducing unnecessary **transhipments**
- realising improved **ecological footprint**.



market challenges require disruption



Maritime / ocean
Container



long-haul
(semi-)trailer



Swap Body



Rigid Truck



City Cargo Van



Cargo Bike

5 different LDU's used in hinterland
(LDMMC-b) logistics & transport

- **no cross-compatibility**
- + diverse services across F/L-M distribution
- **congestion & restrictions making cities unliveable**
- **siload solutions prevent shared cross-use of equipment & data**



global shipping & first/last-mile logistics

NOT interoperable – NOT compatible!

current F/L-Mile distribution:

- **non-transparent using incompatible standards (physical & digital) though established!**
- **pollutive not fit-4-purpose vehicles & equipment**
- **inefficient & non-resilient**
- **expensive & time-intensive**

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CLEANconnect
mobility

CLEANconnect **innovation in motion** **mobility, Pi & iSCM solutions**



CLEANconnect
innovation in motion
mobility, Pi & iSCM solutions

What is needed to realise decentralised

intelligent physical & digital standardised interconnectivity

- collaborate within ***Holistic Dynamic Logistics ecoSystems*** – HDLe
- enabling multiple ***5PL Network Service Providers*** – 5PL-NSP
- managing ***Distributed Network Logistics Platforms*** – DNLP
- advancing towards an ***interoperable Supply Chain Mix*** – iSCM

realising physical internet & ecological consciousness

interoperable • compatible • connected

SMART



modular POD / μ containers & SWAP-body solutions



across Supply Chain Segments & Transport Modes

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Scalable Solutions (example for F/L-Mile Distribution)

an ecoSystem of any vehicle & self-swappable carts for shared use



Source: BrightDrop (GM)



Source: CONTAI



Source: CONTAI

modular safe movement of goods by best fit-4-purpose vehicles, automatic loaders and multiple carts / trolleys, small enough to take advantage of any ground level spot, sidewalk and even getting indoors for hand-delivery

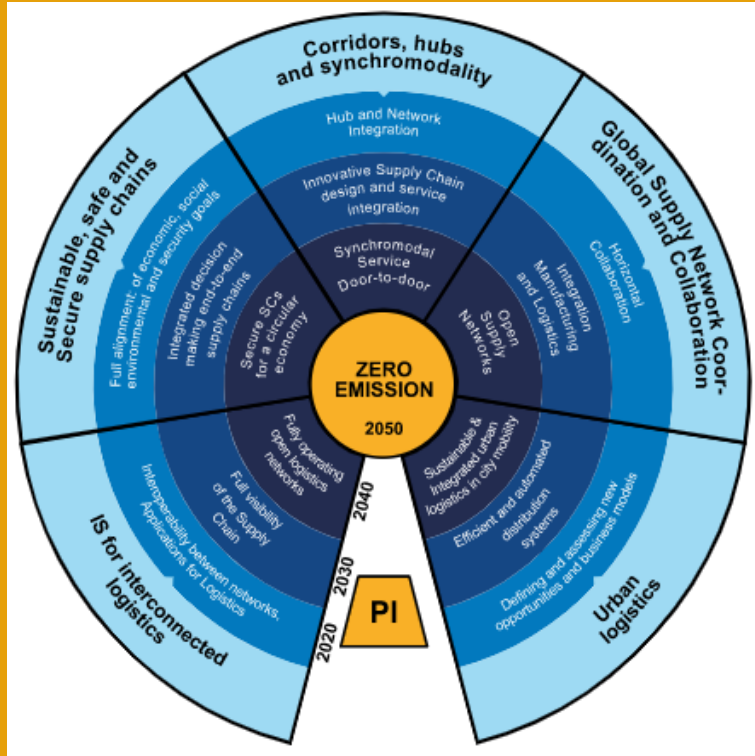
– robotisation and autonomy readiness –

trusted ecosystem for synchromodal optimisation



Physical Internet Roadmap

SMART Logistics Partnership follows the **ALICE-etp Pi Roadmap** and set timelines for realising physical & digital connectivity



Physical Internet builds on

- extensive complex & diversified systemic consolidation of logistics flows
- standardised data (EU MDS)
- Extensive synchro-modality
- pooling demand of equipment resources & assets, using open, connected, shared distributed logistics networks for transport, storage & other logistics operations, distribution of cargo & packages.

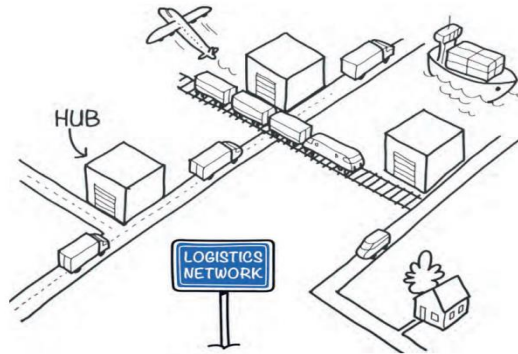
Physical Internet Roadmap

SLP Alliance focuses on Pi components: PI Nodes, PI Networks & System of Logistics Networks

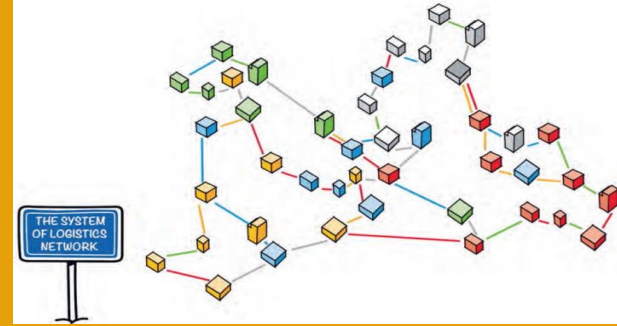
Automated standardised and connected processes and procedures in nodes belonging to logistics networks



Seamless, flexible and resilient, door-to-door services for all shipments



Secure, efficient and extensible services for the flow of goods, information and finances across logistics networks



Generations of Logistics Nodes

The roadmap defines five generations for the development of Logistics Nodes into PI nodes (See Figure 3).

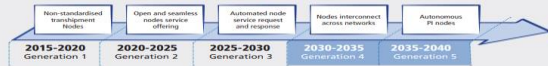


Figure 3 - Overview on generations (possible development stages) for Logistics Nodes

Generations of Logistics Networks



Figure 4 - Overview on generations (possible development stages) for Logistics Networks

Generations of System of Logistics Networks

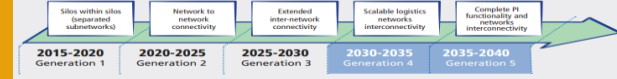


Figure 5 - Overview on generations (possible development stages) for System of Logistics Networks

through HDLe's & 5PL-NSP's towards an interoperable Supply Chain Matrix across supply chain segments & transport modes



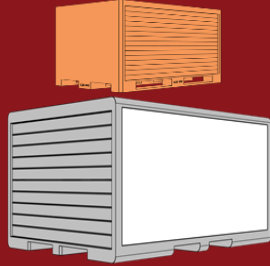


physical connectivity of PODs

infographic

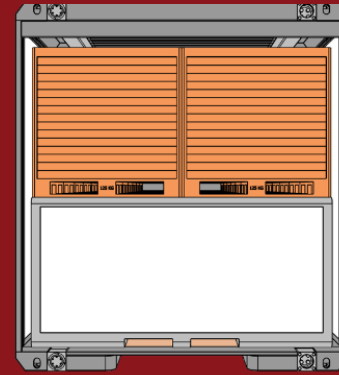


CQ electric secure CHaaS remote/online
EZlock & INTERlock



modular PODs:

- connectable containers
- boxes
- closed / open pallets & μ -containers



telematics:

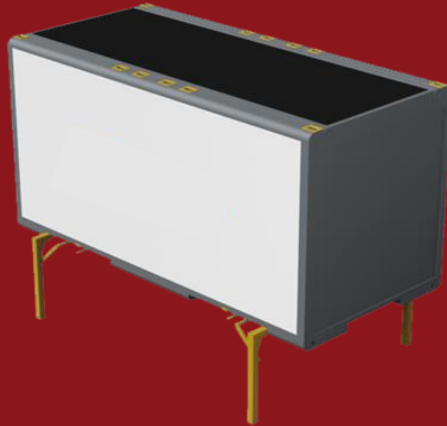
- geo-localisation of equipment to follow cargo in addition to vehicle
 - cloud-based
- IoT (sensors & cameras):**
- content & conditions monitoring
 - loading & unloading security



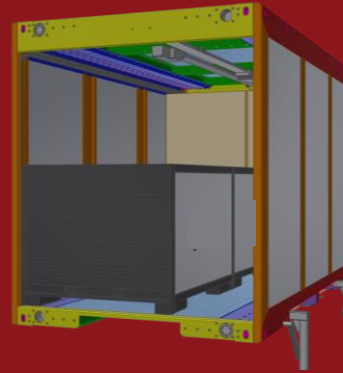
modular connected PODs
up to 3 POD's connectable



SWAP-box type



optimised load capacity



+ optional equipment (solar, load deck, ...)



realising "Physical Internet" through physical connectivity





digital connectivity IoT, 5G-comm. & Telematics

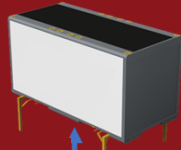
Infographic



GSIN



5G



Interface



telematics module



cloud-based Distributed Network Logistics platforms

Open-source innovation AI & big-data hub



physical & digital connectivity



Intelligence

(ITS – CCAM/ACES...)

IoT+sensors+telematics+AI)



Distributed Network Logistics Platforms

Cloud-based services: SaaS, MaaS, BaaS, EaaS, SHaaS, CHaaS, ULaaS, DaaS, LaaS, AaaS, CPaaS ...

realising "Physical Internet" through digital connectivity



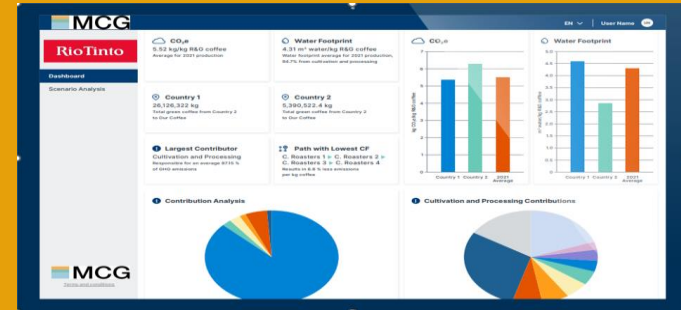
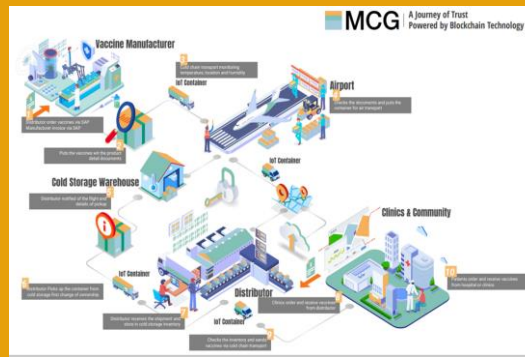
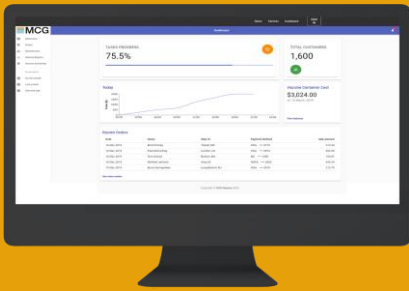


AI & Ledger Technology in Supply Chain

Hardware & Software – Operational Supply Chain Analytics

Hardware: smart container

Software: blockchain-powered



SLP alliance aims for

- open technology with open API's & FENIX connectors based on EU MDS agreed upon standards for data-elements & -models
- facilitating collaboration by all actors across supply chain segments
- enabling Distributed Network Logistics Platforms (by 5PL-NSP's)





Blockchain vs. Database in Supply Chain

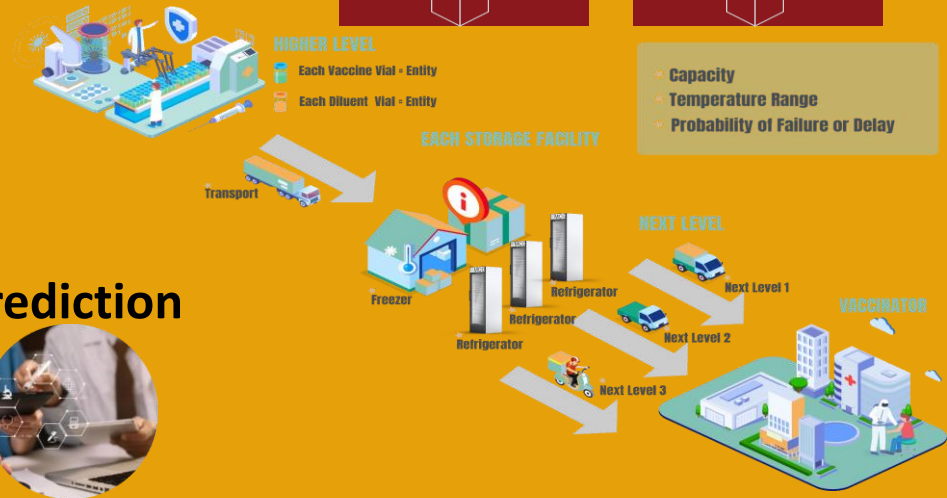
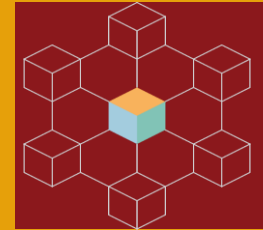
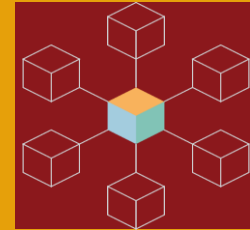
Centred vs Distributed Approach

Current approach: **central database platform**

MCG approach: **distributed blockchain platform**

Added Value for Supply Chains:

1. increase governance & monitoring
2. cost-effectiveness
3. authorised security protocols
4. reduce wastage: **accountability & prediction**

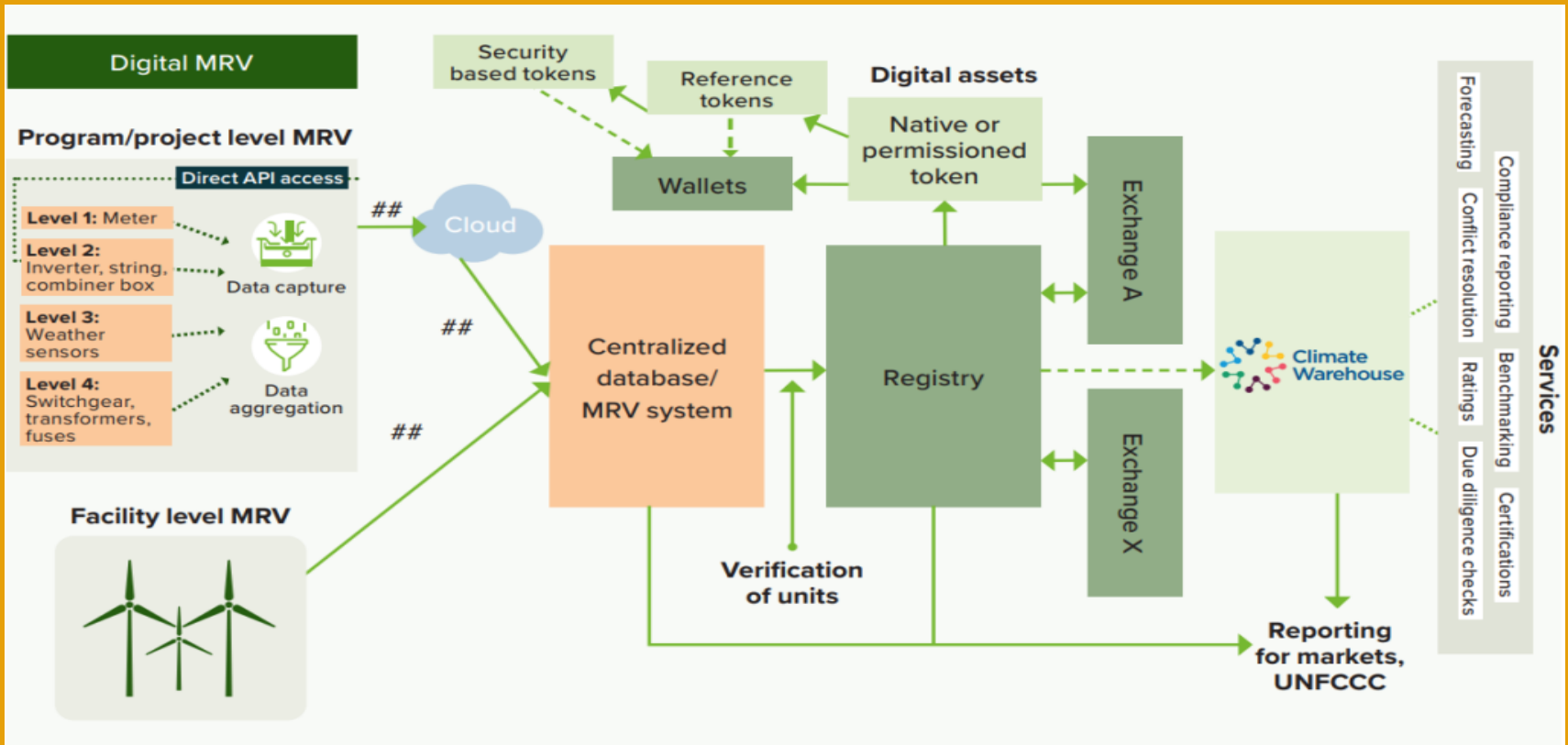


SLP Alliance operates across industries, sectors & geographies (local, regional, across borders)





NET-zero Transition through Technology

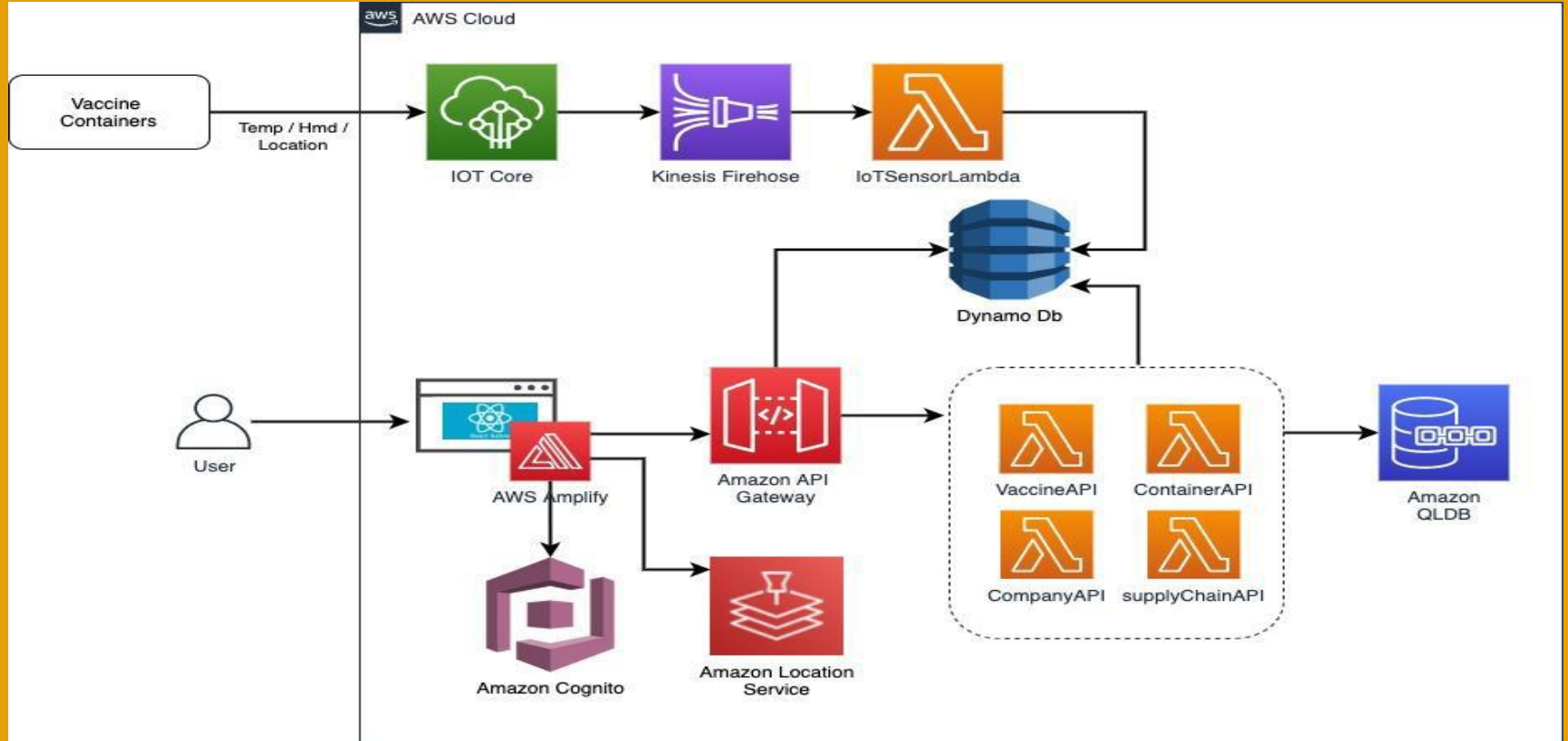


SLP Alliance realises ecological consciousness





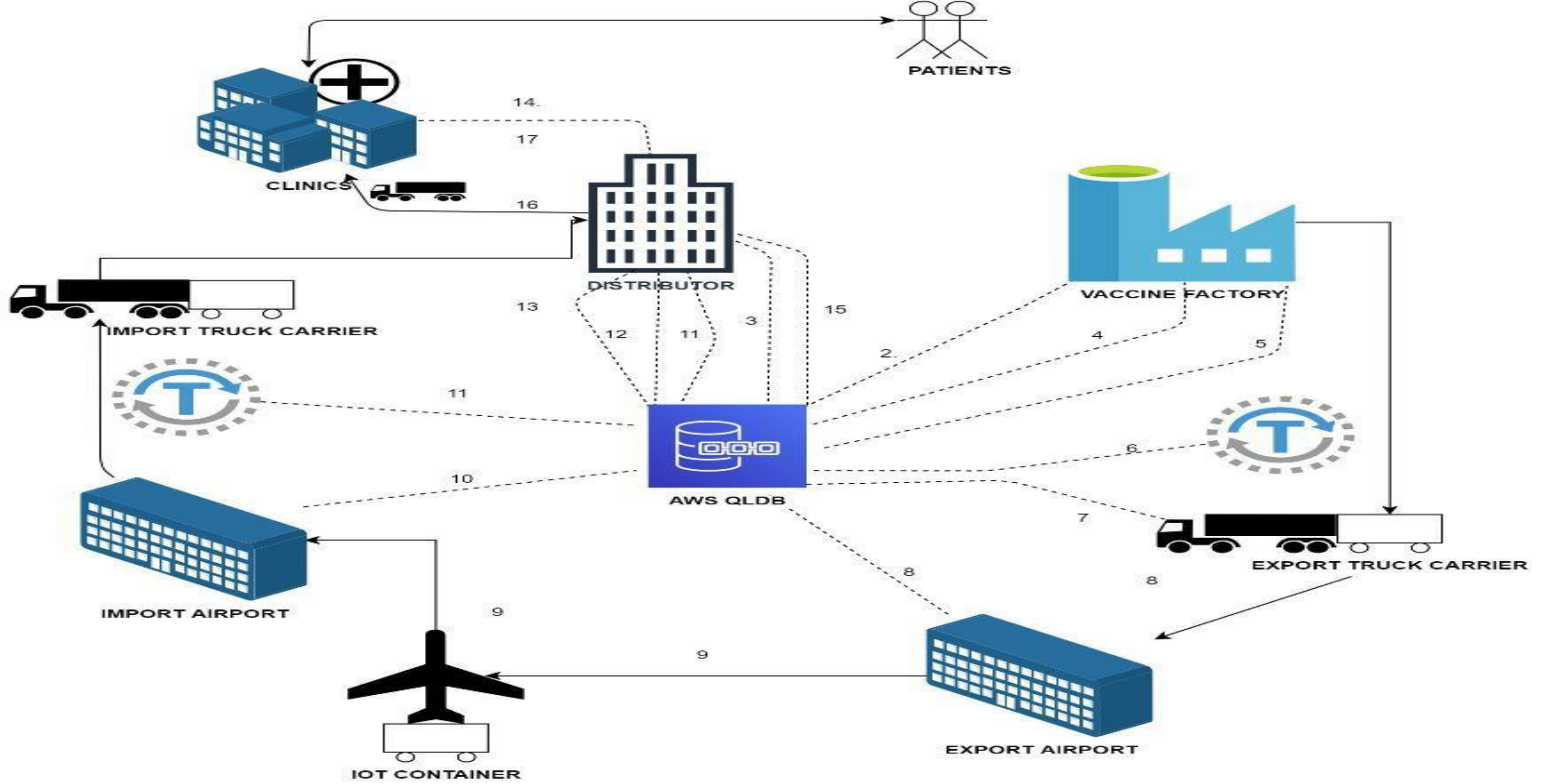
Architectural Design



front-end – database – authorisation – data-processing

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IoT & Blockchain



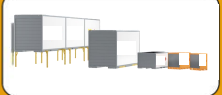
supply chain flow of entities & transferring of ownership of POD/container.



Holistic Dynamic Logistics ecoSystem - HDLe

infographic

1 Modular connectable POD solutions



2 SPL NETWORK SERVICES Primary MAIN Stakeholders

SHIPPERS A

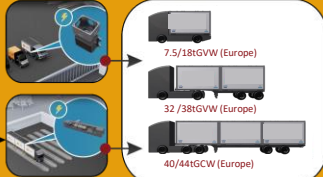
- SSS activity
- using owned or outsourced transport
- Direct deliveries to retail sector
- or via CITY HUBS

LONG-DISTANCE LOGISTICS B (1PL, 2PL, 3PL, or 4PL)

- SSS activities

ECONOMIC ZONES C (for SSS)

- Port Terminals
- Large DC's
- Long-Haul Transfer Hubs
- Economic Zones (FEC, SPEZ, ...)



MultiModal Cross-border Transport:



in-city distribution deliveries returns & pick-ups

CITY HUBS D

- Parking Area (CH + partnerships)
- Direct Transhipment on parking
- Distribution from CH warehouse to destination + returns + pick-ups in CC&Ua
- Warehouse Operations (sorting, (re)packaging, storage, stuffing city-fit boxes and open/closed pallets, ...)

3 ONLINE FREIGHT BOOKING & Cargo Preparation

Place Freight Order A

PACKAGING & LABELLING B

- RFID Chip
- GSIN QR Code

Stuffing of PODs, boxes, pallets & µcontainers

Update Freight Booking Platform D (using digitalised RFID or GSIN QR code)

5 FIRST/LAST-MILE distribution

- CEP market (Courier & Postal Services)
- Light City Vehicles & Vans (different sizes, limited weight & size fit for cities)
- Cargo BIKES & TRIKES

4 Secondary MAIN Stakeholders

GLOBAL TRANSPORT SECTOR A

OCEAN SHIPPING B

PORTS C (cargo related data sharing)

- ETA / ETD
- piloting, birthing
- loading / unloading
- other port & port terminal activities

ECONOMIC ZONES D (for GTS)

6 Non-stakeholder BENEFICIARIES

- economic, social & ecological impact + efficiencies across SCS & actors
- regional & national authorities
- city governments
- liveable cities & happy citizens
- satisfied e-commerce clients
- B2B + B2C healthy growth e-commerce
- collaborative SCS actors & stakeholders
- climate change results
- improved nature & public health

collaborative supply chain partnerships

interoperability across SC segments & transport modes





interoperable Supply Chain Matrix – ISCM & 5PL-NSP

infographic

7

Fit-4-purpose vehicle & POD solutions + partnerships



A

Conventional & electric Fit-For-Purpose vehicles

B

Transport Flow

Conventional Truck L-DMMC-b



Autonomous Trailer Drones C

at City Hubs parking D

2

5PL NETWORK SERVICES

A

SHIPPERS - DELIVERIES, RETURNS & PICK-UPS

- direct deliveries to retails sector
- CC&Ua deliveries via CH
- CC&Ua pick-ups & returns
- receiving POD containers, boxes & pallets



MultiModal Cross-border Transport: B

ROAD	SSS
RAIL	HYPERLOOPS
IWW	CARGO DRONES
AIR	Other future modes of transport

4

Secondary MAIN Stakeholders

A

GLOBAL TRANSPORT SECTOR

B

OCEAN SHIPPING

C

PORTS (cargo related data sharing)

D

ECONOMIC ZONES (for GTS)

- ETA / ETD piloting, birthing
- loading / unloading other port & port terminal activities

7

CITY HUBS

← 7 D Infographic 1:2 D

- B2C home or drop-off delivery + returns
- Receiving SHIPPER stuffed PODs (c,b&p)
 - Direct Transhipment at CH Parking
 - Handling through CH warehouse
- City based B2B & B2C in CC&Ua
- City based B2B & B2C collected
 - for SHIPPER
 - for L-DMMC-b hinterland destinations
 - for SSS
 - for EXPORT
 - for maritime transport

5

FIRST/LAST-MILE distribution

- CEP market (Courier & Postal Services)

Light City Vehicles & Vans (different sizes, limited weight & size fit for cities)



2

ECONOMIC ZONES

(for GTS)

- Port Terminals
- Large DC's
- Long-Haul Transfer Hubs
- Economic Zones (FEC, SPEZ, ...)

realising physical internet & econological consciousness

In global → to/from ← local logistics of cargo flows

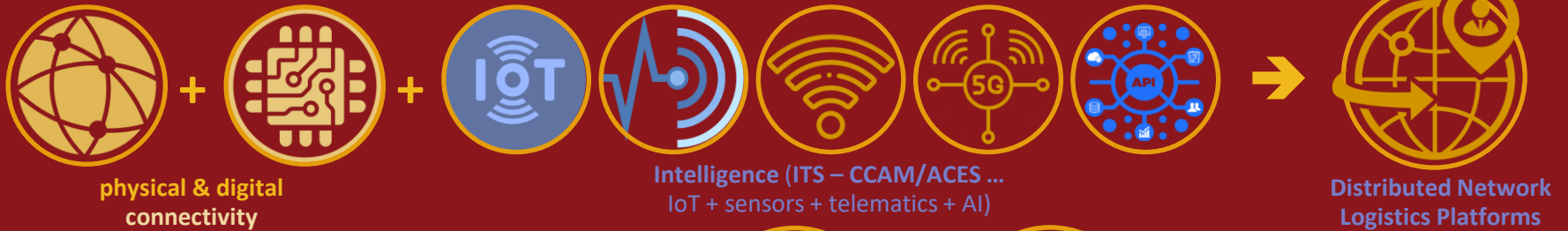




CLEANconnect
mobility

infographic

HDLe + 5PL-NSP advances towards iSCM interoperable • compatible • connected

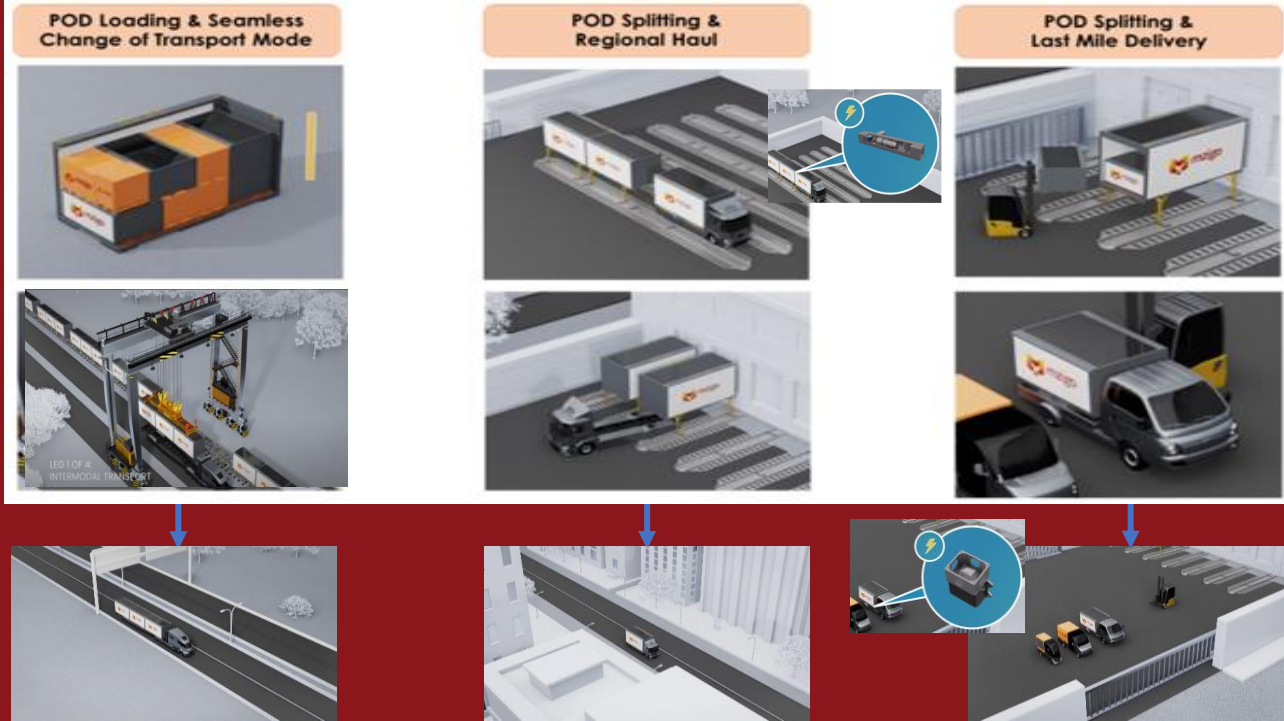




Holistic Dynamic Logistics ecoSystem

infographic

MZIGO 3 min. video at:
available upon request



load-matching ecoSystem connecting shippers & receivers

GTS from/to L-DMMC-b from/to F/L-M





Evolution Path of First/Last-Mile Distribution

SORTING CENTER CITY HUB CURBSIDE INDOORS

B

C

A



LORRY



CARGO BIKE



CART

B → Pedal-assisted cargo vehicle with *multiple* small Carts

CART



ELECTRIC VAN



CART

C → e-Van with multiple small Carts



ROLL CAGE



LORRY



CARGO BIKE



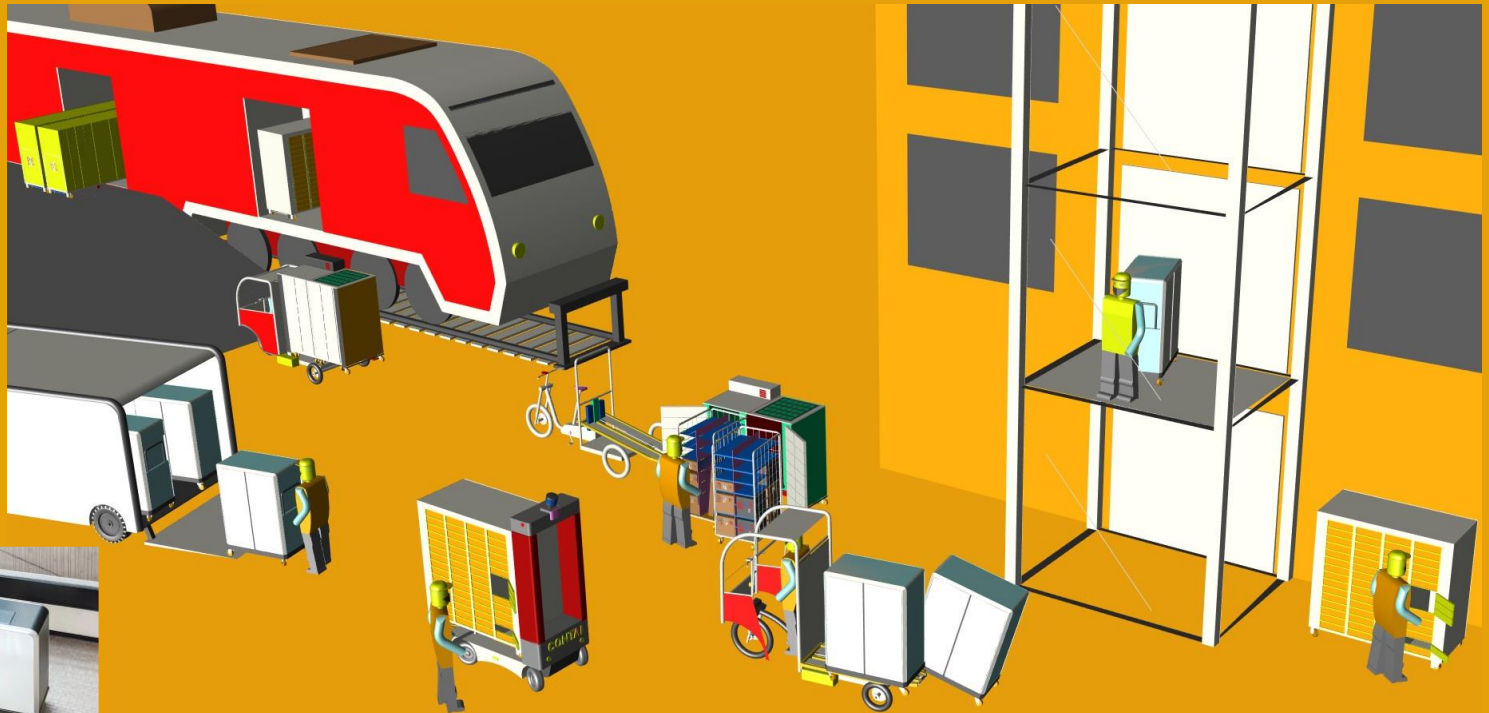
HANDS

A → Pedal-assisted cargo vehicle





Extended deliveries indoors by small handy carts & trolleys

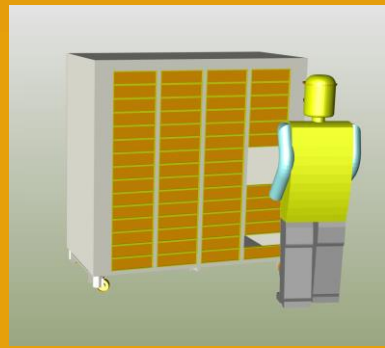
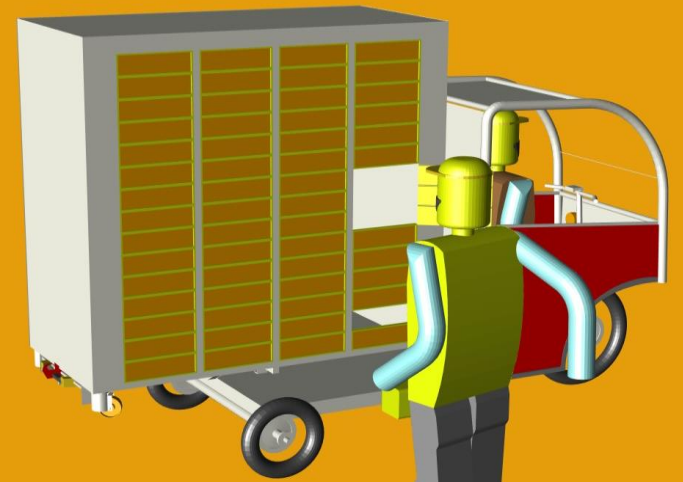
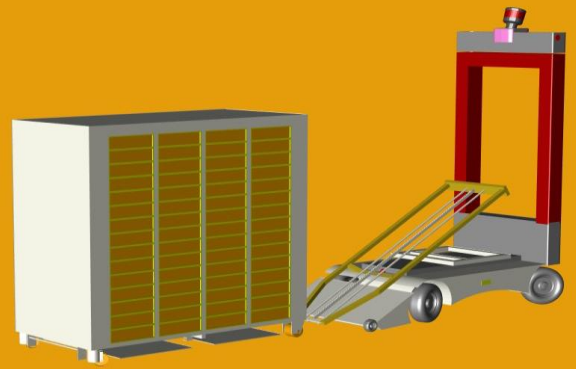


**BrightDrop (GM) has developed a
small e-cart for electric vans**

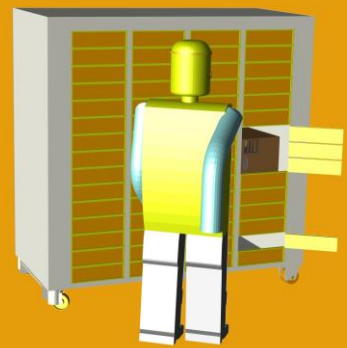




Synergy of Synchronous & Asynchronous Modes by self-swappable cargo and service applications



synchrone delivery



asynchrone delivery





Long-Distance MultiModal Cross-border to/from First/Last-Mile & In-City Distribution by wheeled PODs and automatic docking



managed by *independent* City Hubs

SMART



Safe Supply Chain with cargo encapsulation



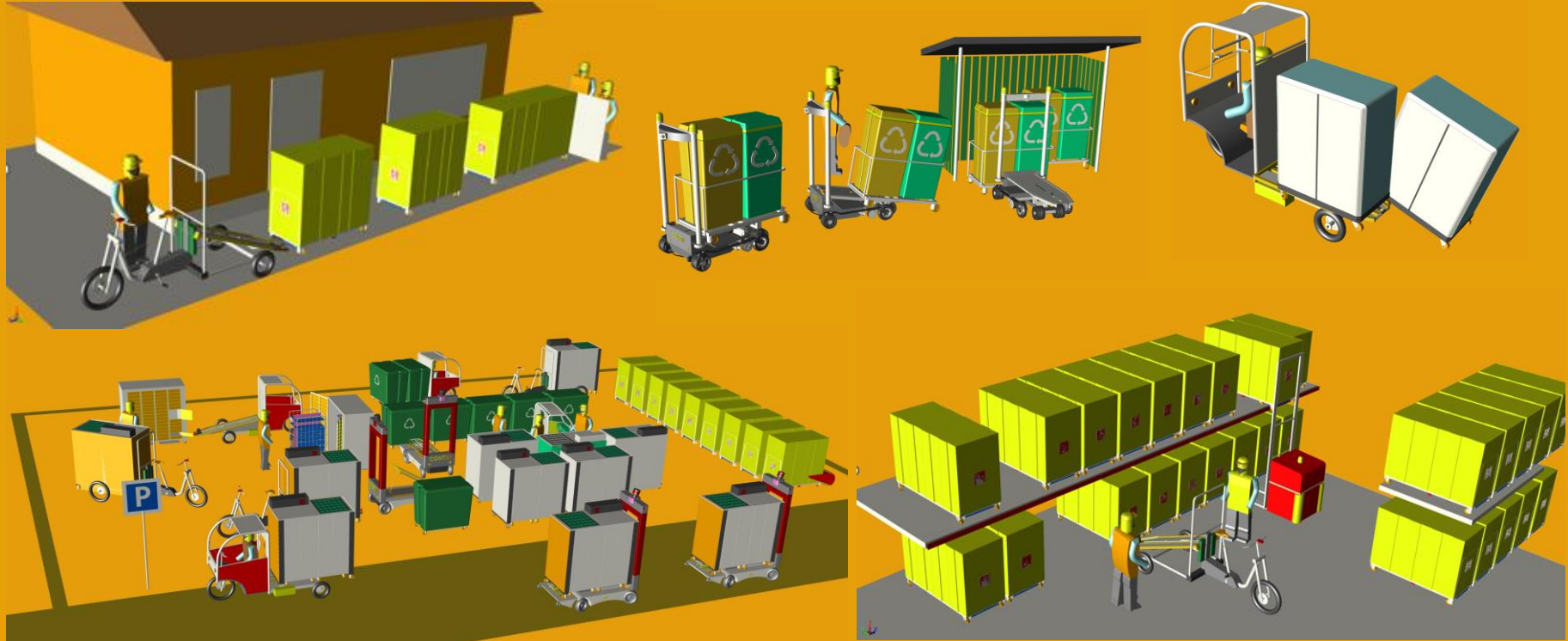
 multimodal handling across
supply chain segments & transport modes





Ultimate Flexibility

by easy loading & unloading on any ground level spot

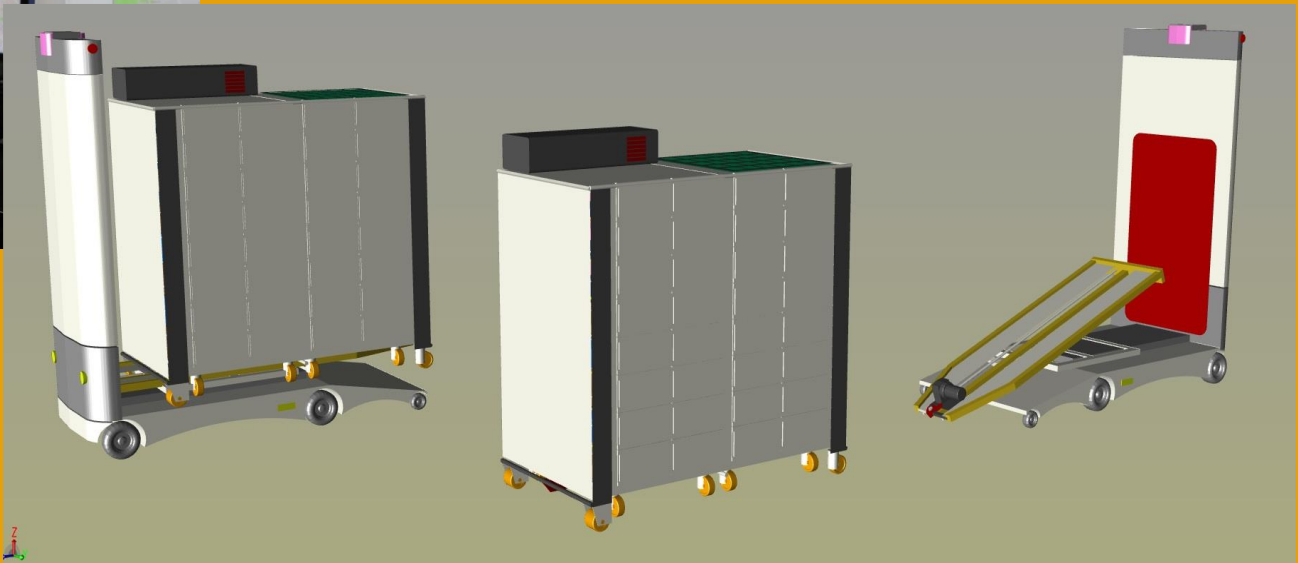
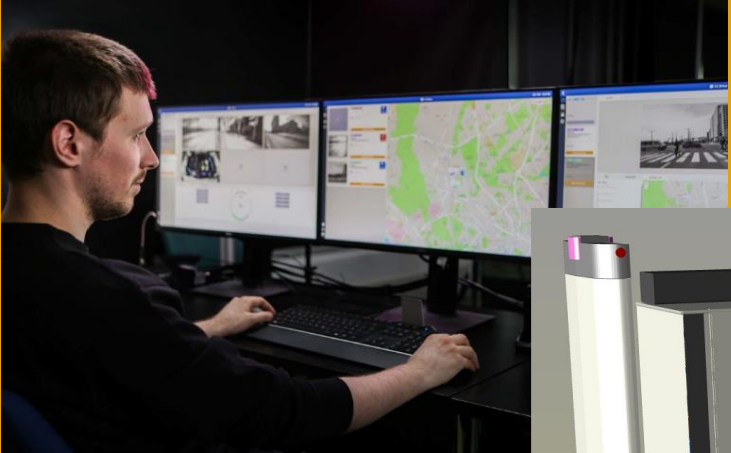


autonomous loading as a unique feature

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Autonomous Processes with truly autonomous remote handled docking



realising physical & digital connectivity **SMART**



Promotion of Circular Economy with the life-time use of legacy and future technologies + smooth transition towards the autonomous First/Last-Mile



ecological handling & distribution of
perishables, wastes & packages





CONT AI Approach for μ (micro)-containers interoperability from one vehicle and one container approach to multiple small containers, carried by any vehicle



connectivity, effectivity, diversity, scalability, multimodality, accessibility, shareability, traceability, sustainability, autonomy

CONT AI video on F/L-mile μ (micro)-containers/boxes : <https://www.youtube.com/watch?v=iQIcVcvLbI4&list=P LxZzmeOGt7IfTa-wTWfxg68UMMqGVG-1V&index=4>



The next level in Last Mile innovated by CONT AI: Micro Mile Logistics: Access to indoors - the final place of use

connectivity – effectivity – scalability – accessibility – shareability – traceability

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SMART Logistics Partnership

Collaborative supply chain partnerships generating
Holistic Dynamic Logistics ecoSystems (HDLe's)
& *5PL Network Services Providers (5PL-NSP's)*
managing *Distributed Network Logistics Platforms (DNLP's)*
realising "*Cities as Logistics Hubs*" for
Physical Internet & interoperability enabled through
Physical & Digital Connectivity, advancing towards
global interoperable Supply Chain Matrix (iSCM)

Join our LI Group:

@Physical Internet by SLP Alliance

<https://www.linkedin.com/groups/14197842/>



SMART Logistics Partnership

available for expanding partnerships & introducing SC-actors to participate in livinglabs



Expanding the logistics Scope

13-15 JUNE
Athens, Greece
www.pi.events/IPIC2023

CALL FOR CONTRIBUTIONS & SUBMISSIONS

alice | Alliance for Logistics Innovation through Collaboration in Europe

Institute of Communication and Computer Systems (ICCS) of the National Technical University of Athens (NTUA)

IPIC 2023

9th International Physical Internet Conference

June 13-15, 2023
Athens, Greece

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SMART Logistics Partnership

Q&A



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setting the roadmap for the Physical Internet

or visit our booth for more info, videos, partnerships and livinglabs

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CONTAI Founding Team



Start-up based in Finland

- Founded in 2019
- Background in the trailer business
- The legacy company behind the CONTAI brand is VERICREA business ID FI29420279

Seppo Narinen, M.Sc (Mech.)

Mechanics innovation, IPR
seppo.narinen@contai.eu

Erno Simonen, M.Sc (Mech.)

Business Model, Communication, IoT

CONTAI was awarded several awards, including 2 in the 'pre-start-up' series.

CONTAI participated in the IPIC start-up competition.

CONTAI is an awarded member of ALICE-etp.





Operational Traceability of Cargo



**Reinventing Traceability
Enhancing Scope 3 Carbon Visibility
Turning Sustainability into Action**

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Standards & LivingLabs



cargo does **not** move
unless data moves

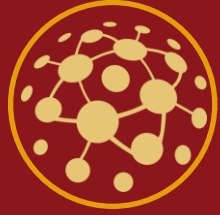


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HDLe + 5PL-NSP → iSCM



CLEANconnect mobility

CLEANconnect-Mobility is a spin-off from



CLEANconnect

- @clean-connectnet
- @CLEANconnectnet
- @CLEAN.connect
- @CLEAN.connectnet

CC-Mobility

- @CLEAN-iSCM
- @CLEAN_iSCM
- @CLEAN.iSCM

mobility, Pi, 5PL & iSCM solutions
 connecting markets, supply chain
 actors & stakeholders
 advancing towards an
 interoperable Supply Chain Matrix

