Supply Chain and Industrie 4.0

Hyperconnected SC in different industries

Input

Prof. Dr. Martin Tschandl

09:00 — **Room: HS I**

Plenary keynote: Challenges and opportunities for a 3PL
Keynote speaker: Pablo Gomez
Innovation Director and Iberia General Manager
FM Logistics

Session 9: Supply chain and Industry 4.0

09:45 — **Room: VIII**

Keynote 9: How to successfully manage Industry 4.0 along the supply chain and what it will mean for the industry by 2035
Keynote speaker: Prof. Michael Henke - Director of the section Enterprise Logistics, Fraunhofer Institute for Material Flow and Logistics, Germany

10:20

Workshop 9.1: Hyperconnected SC in different industries
Leader: Martin Tschandl - Professor and head of department for management, FH Johanneum, Austria

Contributions:
- Towards Hyperconnected Resource Requirements Planning; Raphaël OGER - Ph.D. Candidate, Industrial Engineering Center, Mines Albi, Toulouse University, France
- Lean thinking to foster the transition of the traditional logistics towards the Physical Internet; Luis López- Molina - Professor; Universidad de Cádiz, Spain
- Hyper-connected Modular Renewable Energy Production; Suzanne Marcotte - Professeure, Department of Management & Technology, Université du Québec à Montréal, Canada / Changliang Liu - Founder & CEO, McGili, Canada
- Industry 4.0 and IoT: enabling technologies and approach for fast and efficient door to door supply chain; Simone Siria - Analyst and Consultant, Log@Sea – Circle srl, Italy

Supply Chain and Industrie 4.0

Hyperconnected SC in different industries

Some comments on terms and concepts

Digitalisation…

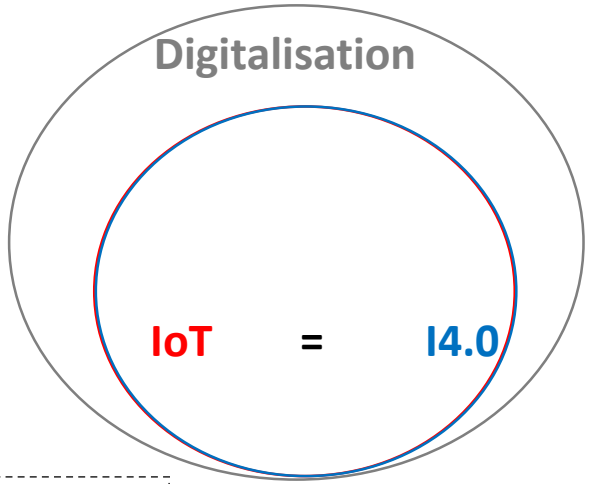
…implies the integration of digital technologies into everyday life by the digitization of everything that can be digitized. **Digitization** means the transformation of analog information into data which can be processed electronically.

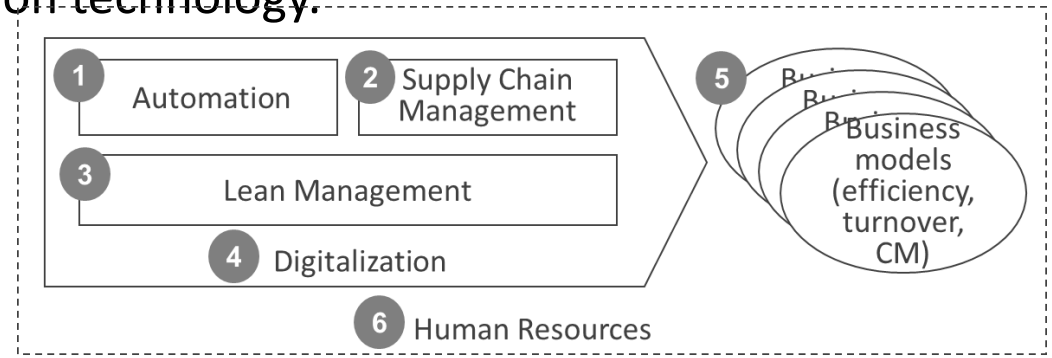
Internet of things (IoT)…

…Internet of everything and everywhere, connecting everything to the internet.

Industry 4.0…

…integrates manufacturing with state-of-the-art information and communication technology.





Supply Chain and Industrie 4.0

Hyperconnected SC in different industries

Digitalisation…

…implies the integration of digital technologies into everyday life by the digitization of everything that can be digitized. **Digitization** means the transformation of analog information into data which can be processed electronically.

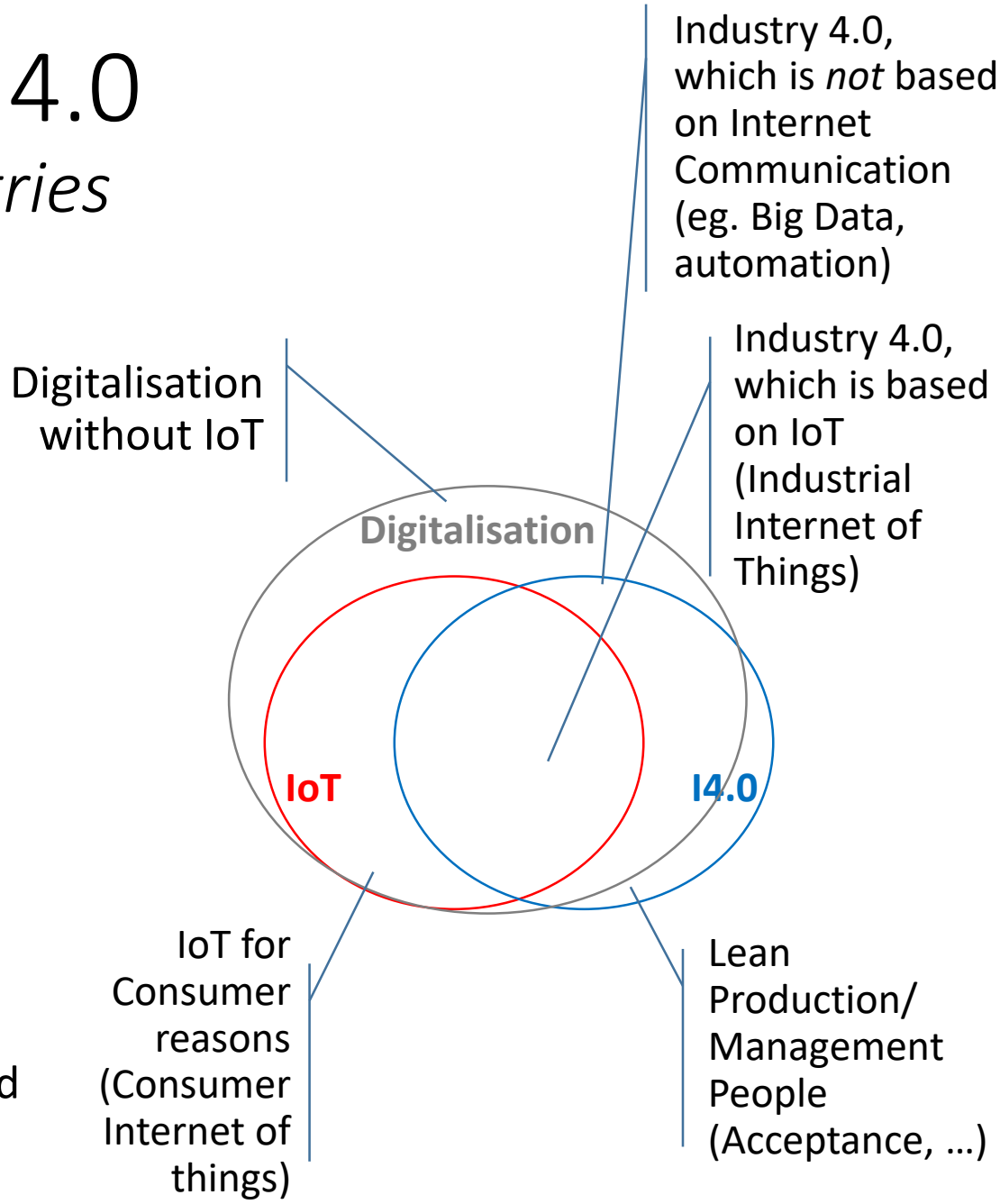
Internet of things (IoT)…

…Internet of everything and everywhere, connecting everything to the internet.

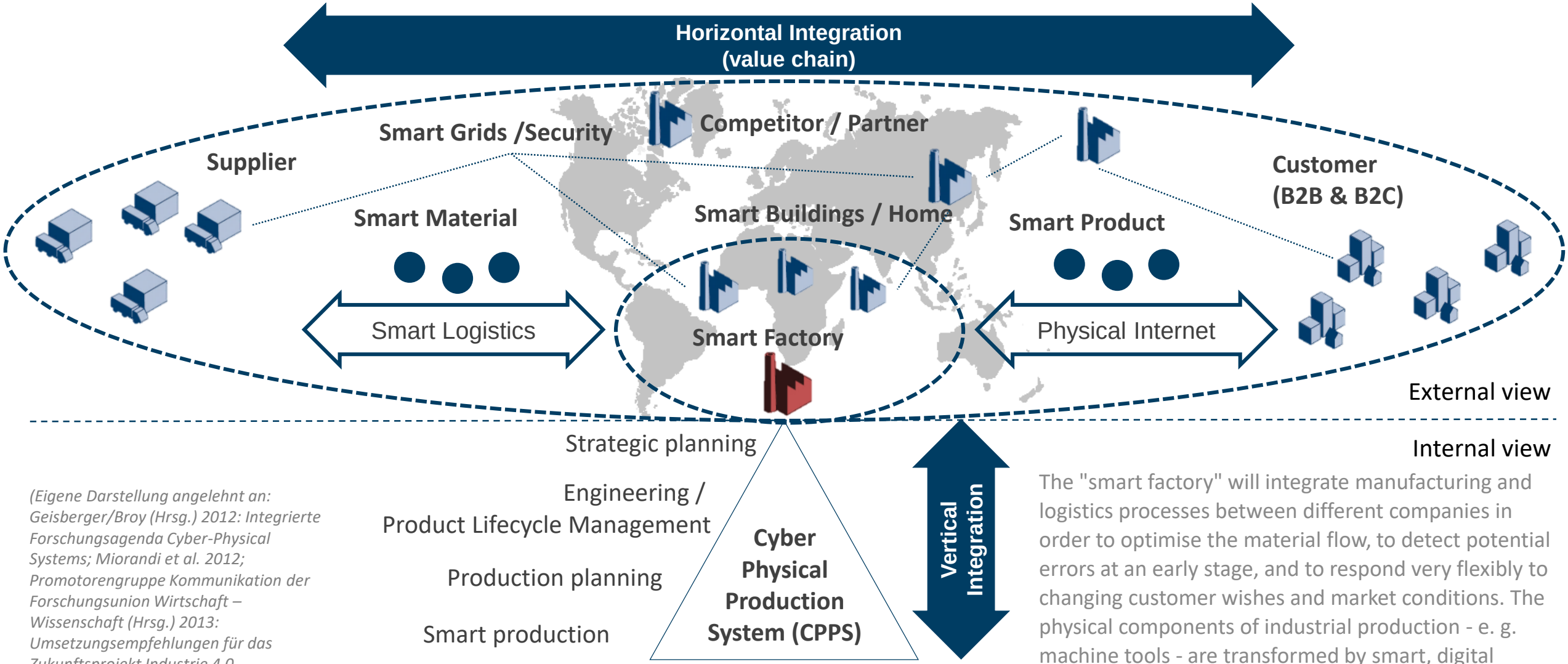
Industry 4.0…

…integrates manufacturing with state-of-the-art information and communication technology.

The **digital Internet** transmits data in standardized packets via a global information network at high speed.
The **Physical Internet** will transmit products in standardized packages via a global transportation network with great efficiency.



I4.0 & Smart Topics @ Industrial Management



(Eigene Darstellung angelehnt an: Geisberger/Broy (Hrsg.) 2012: Integrierte Forschungsagenda Cyber-Physical Systems; Miorandi et al. 2012; Promotorengruppe Kommunikation der Forschungsunion Wirtschaft – Wissenschaft (Hrsg.) 2013: Umsetzungsempfehlungen für das Zukunftsprojekt Industrie 4.0-Abschlussberich)

The "smart factory" will integrate manufacturing and logistics processes between different companies in order to optimise the material flow, to detect potential errors at an early stage, and to respond very flexibly to changing customer wishes and market conditions. The physical components of industrial production - e. g. machine tools - are transformed by smart, digital networking into cyber-physical systems (CPS). They form the basis of the smart factory of the future.

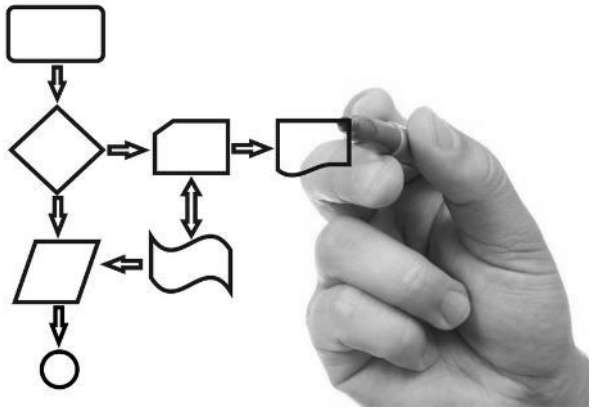
Supply Chain and Industrie 4.0

Hyperconnected SC in different industries

Benefits of Industry 4.0

- **Efficiency:** lower costs by benefits in the vertical and horizontal integration
- **Effectiveness:** individual products (ideal: lot size 1) at the cost of mass products
- **New Business Models:** often IoT-based
- **Global economic policy:** *"We must…deal quickly with the fusion of the online world and the world of industrial production. In Germany, we call it Industrie 4.0. Because otherwise, those who are the leaders in the digital domain will take the lead in industrial production." (*Angela Merkel at the 2015 World Economic Forum in Davos, Switzerland)

Before Industry 4.0: Balance?



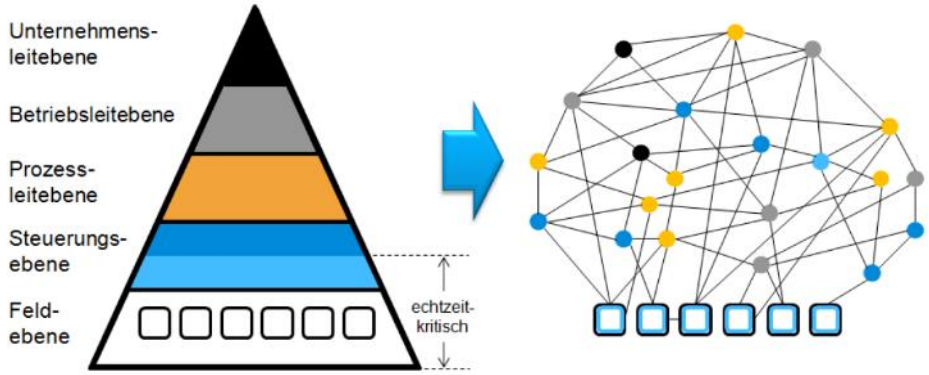
People

?

Processes / Organisation

IT

With Industry 4.0: Imbalance?



(Quelle: VDI/VDE-Gesellschaft Mess- und Automatisierungstechnik 2013: Cyber-Physical Systems- Chancen und Nutzen aus Sicht der Automation)

Current processes are ready for Industry 4.0

End of the automation pyramid?

Processes / Organisation

People

New tasks?

New competencies?

Digitalisation

Bandwidth

IPv6

Cloud/SaaS

In-memory-computing

Realtime

Internet of Things

Big Data

Smart „Everything“

IT

*The widespread use of IT and smart objects in production processes requires the consideration of the entire "ecosystem"; consisting of **technology**, **people** and **organization**.*

„ (Bauer et al. 2014*: Industrie 4.0-Volkswirtschaftliche Potenziale für Deutschland, S. 7)*

Lean thinking to foster the transition from traditional logistics to the Physical Internet

4th IPIC TU GRAZ 2017

López-Molina, L; Cervera Paz, A; Popa, A.C.; Rodríguez Cornejo, V.M.; García García, R; Pérez Fernández, V; Buiza-Camacho, G.

University of Cadiz

Luis.lopez@uca.es


Golfo de Vizcaya
Andorra
Barcelona
Oporto
Madrid
Portugal
España
Valencia
Lisboa
Sevilla
Granada
Málaga
Gibraltar
Argel
مدينة الجزائر
Google
Gran Teatro Falla
Cádiz
Hospital Universitario
Puerta del Mar
CA-36

Introduction

Today's world is hyperconnected and this reality is only expected to increase in the future (Coe & Yeung, 2015).

Connections extend to people, institutions, companies and countries, affirming that it is difficult to progress whilst remaining isolated (Dasgupta & Sanyal, 2009).

PI is a true revolution applied to physical objects (Pan et al, 2017).

University of Cadiz

Luis.lopez@uca.es

Background

1.- Since 2016 year we are trying to show the benefit of Physical Internet to different companies in Cádiz (South Spain)

2.- But the companies are “skeptics”

3.- We were thinking the way to explain the PI using Lean.

Due to since 2012 we are doing each year a Conference for free for companies about this concept that now is known.

University of Cadiz

Luis.lopez@uca.es

LEAN Conferences Cádiz

III LEAN Conference 2014

V LEAN Conference 2016

IV LEAN Conference 2015

II LEAN Conference 2013

I LEAN Conference 2012

University of Cadiz

Luis.lopez@uca.es

Objetives

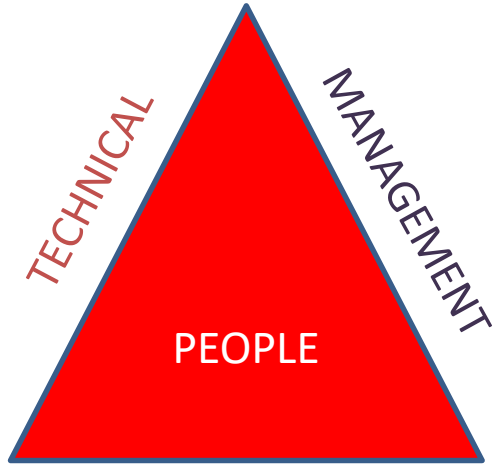
This study “as a Literature review” aims to highlight the close relationship between the PI and Lean paradigms and the added value that is therefore applicable when they are jointly considered in analysing and enhancing logistical networks.

University of Cadiz

Luis.lopez@uca.es

The Toyota Production System (TPS) (Liker, 2004)

Toyota Production System = Operations Management System to achive goals of highest quality, lower cost, shortest lead time via engaging people toward goals



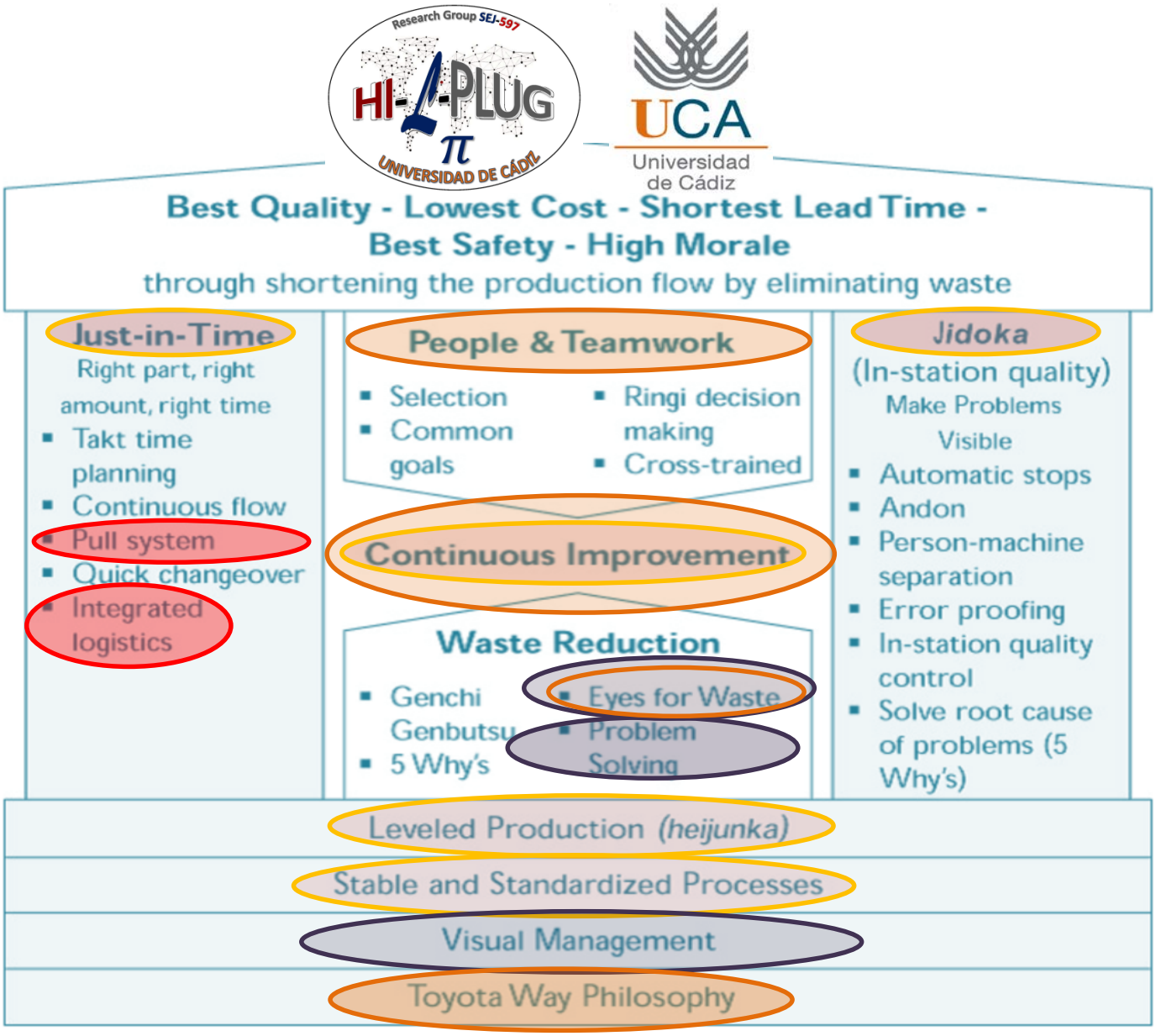
Technical
- JIT
- Jidoka
- Kaizen
- Heijunka
- Stability

Management
- Go and See
- Problem Solving
- Presentation Skills
- Project management
- Supportive culture
- True North
- Tools to focus management attention

Phylosophy/ Basic Thinking
- Customer First
- People are most important asset
- Kaizen
- Go and See
- Efficiency Thinking

A Toyota leader's view of Toyota Production System (TPS) (Liker, 2004)

Luis.lopez@uca.es



The Toyota Production System (TPS) (Liker, 2004)

Luis.lopez@uca.es

Our work is located

In the 1st Roadamap Alice basic, 2016: Sustainable, Safe and Secure Supply Chains:

The effects of the strategies proposed in this roadmap are measured using the following objectives: Transport reduction (percentage of overall value), Improved carrier/ULD utilisation (volume/weight), Emission reduction, Increased re-use, Supply chain cost reduction and Supply chain service improvement (quality and due date reliability)

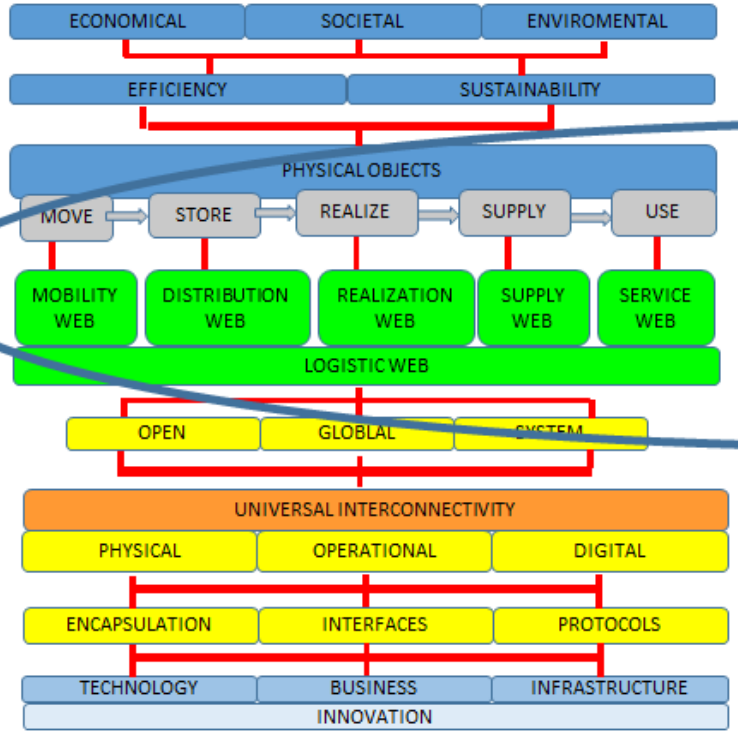
In The second principle of Lean **Map the Value Stream** (Womack et al 2003) – keep it simple & involve those who work the process…help them to see

& **Foundation** of **PI**: **Logistic Web** (Montreuil, et al. 2012)

University of Cadiz

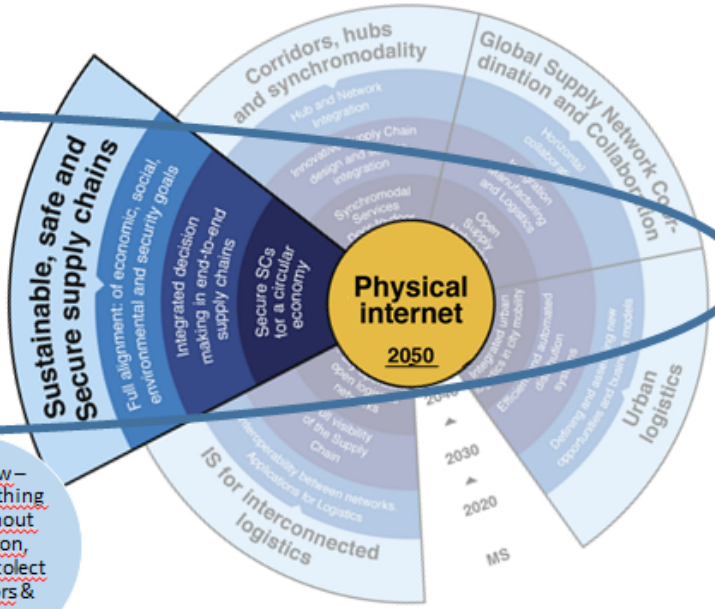
Luis.lopez@uca.es

Interaction between LEAN en PI = VSM



Foundations of the Physical Internet, Montreuil

The 5 Principles of Lean Thinking - James J. Womack and Daniel T. Jones

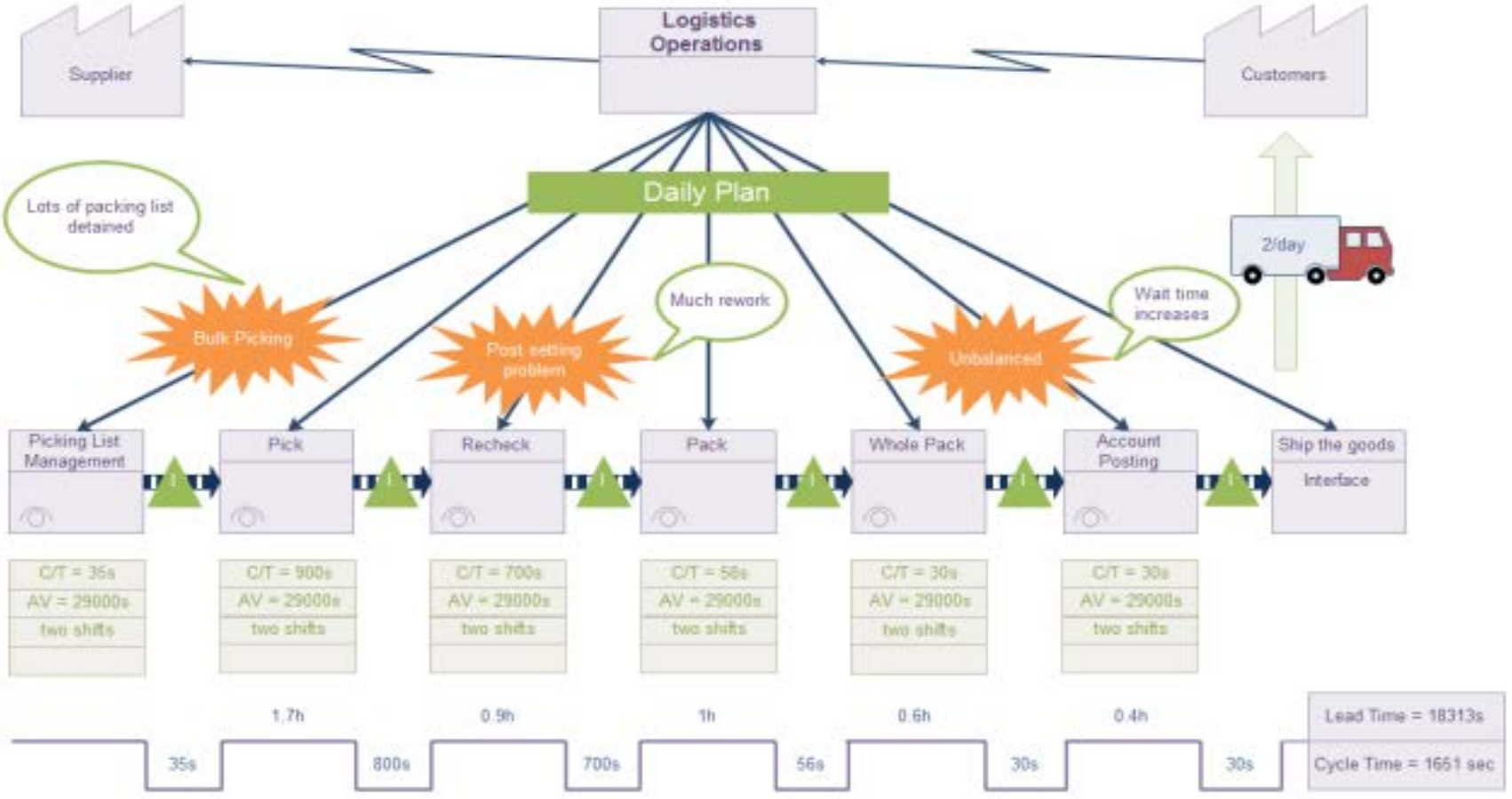


ALICE Road Map Physical Internet 2

University of Cadiz

Luis.lopez@uca.es

Value Stream Mapping



University of Cadiz

Luis.lopez@uca.es

VSM in Logistics

VSM, a LEAN tool used in logistics, illustrates in a single document a map of the process from supply to customer. This technique can find activities that are NOT adding value.

Some of these activities are: **excessive storage**, **overproduction**, **excessive and unnecessary waiting times**, **defects**, **rejections** and reprocessing and **unnecessary transport and movement**.

Storage, waiting times and unnecessary transport and movements are at the heart of the PI.

University of Cadiz

Luis.lopez@uca.es

Conclusion

This study reveals the close relationship between **Physical Internet** and **Lean paradigms**; and the added value that they jointly contribute to analysing and enhancing **logistical networks**.

University of Cadiz

Luis.lopez@uca.es

Conclusion

Basically, applying Lean Thinking will get the right quantity of the right things in the right places at the right time, minimising waste and being flexible and open to change.

As a consequence, applying Lean helps reduce costs, creates value for the company and improves results across the supply chain from manufacturing to the customer.

University of Cadiz

Luis.lopez@uca.es

Conclusion

Other waste which could be included and located using VSM are: empty transport and unnecessary CO2 emissions.

This proposal offers a tool to achieve the objectives set out in the first roadmap which ALICE designed to achieve the PI.

University of Cadiz

Luis.lopez@uca.es

Future Work

The main limitation to the conclusions in this study are found in its theoretical character as it is based on a systematic bibliographical revision of the theme covered.

For this reason, the research team proposes carrying out a future research project focusing on adapting at least one company in the logistics sector to the **PI** concept,

including applying Lean techniques, such as VSM.

University of Cadiz

Luis.lopez@uca.es

Thank you very much!

4th IPIC TU GRAZ 2017

López-Molina, L; Cervera Paz, A; Popa, A.C.; Rodríguez Cornejo, V.M.; García García, R; Pérez Fernández, V; Buiza-Camacho, G.

University of Cadiz

Luis.lopez@uca.es

IMT Mines Albi-Carmaux
École Mines-Télécom

Georgia Tech

Pierre Fabre

ARMINES

TOWARDS HYPERCONNECTED RESOURCE REQUIREMENTS PLANNING

Raphaël OGER, Matthieu LAURAS, Benoit MONTREUIL,
Frédérick BÉNABEN, Nicolas SALATGE

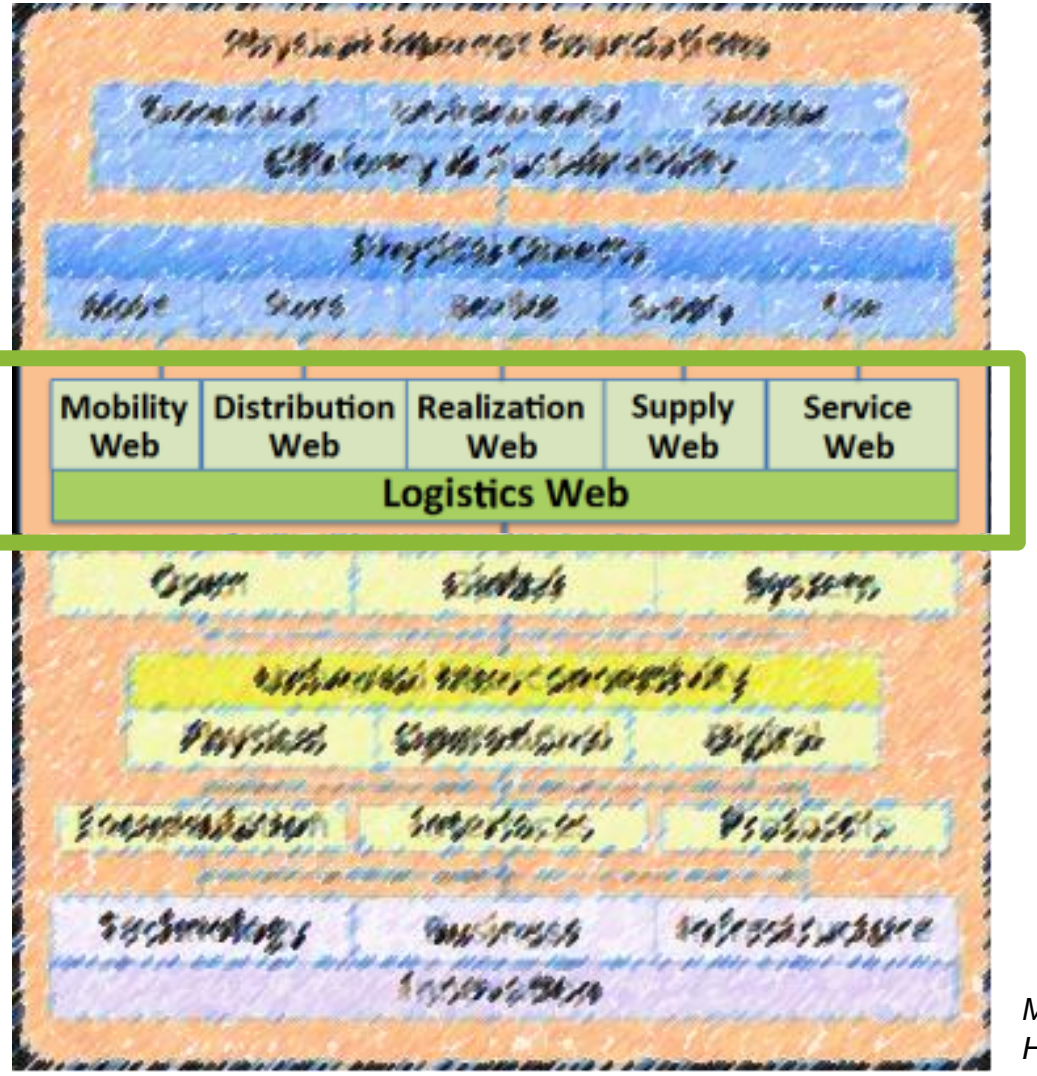
With the support of the industrial research chair

Supply Chain Agile

4th IPIC Conference
July 6th 2017
Graz, Austria

PHYSICAL INTERNET FOUNDATIONS FRAMEWORK

Focus on the Logistics Web



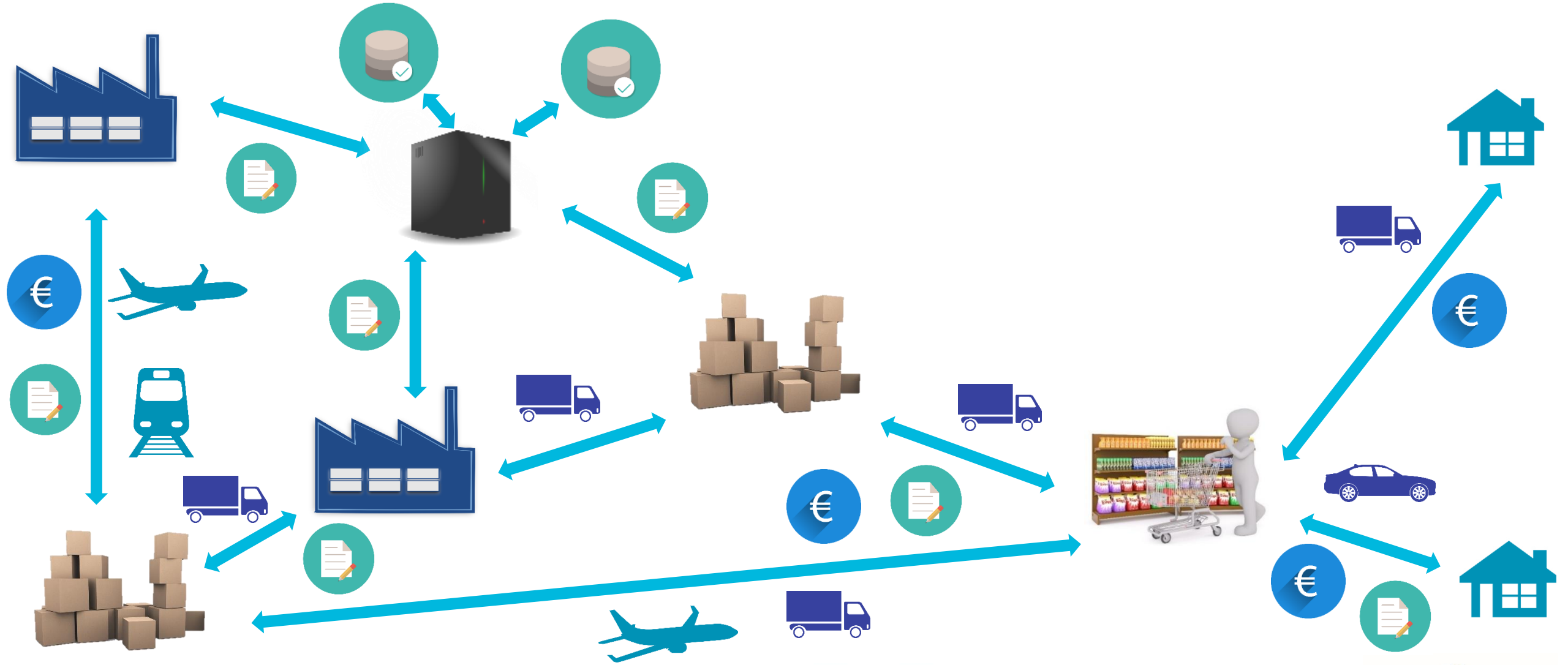
A network of interconnected agents: physical, digital, human, organizational and social.

“A web aiming to serve logistics needs”

Montreuil, B., Meller, R.D., Ballot, E., 2013. Physical internet foundations, in: Service Orientation in Holonic and Multi Agent Manufacturing and Robotics. Springer, pp. 151–166.

LOGISTICS WEB

Interconnected physical, digital, human, organizational and social agents



FROM THE STATE OF THE ART TO OUR CHALLENGING QUESTION

Operational

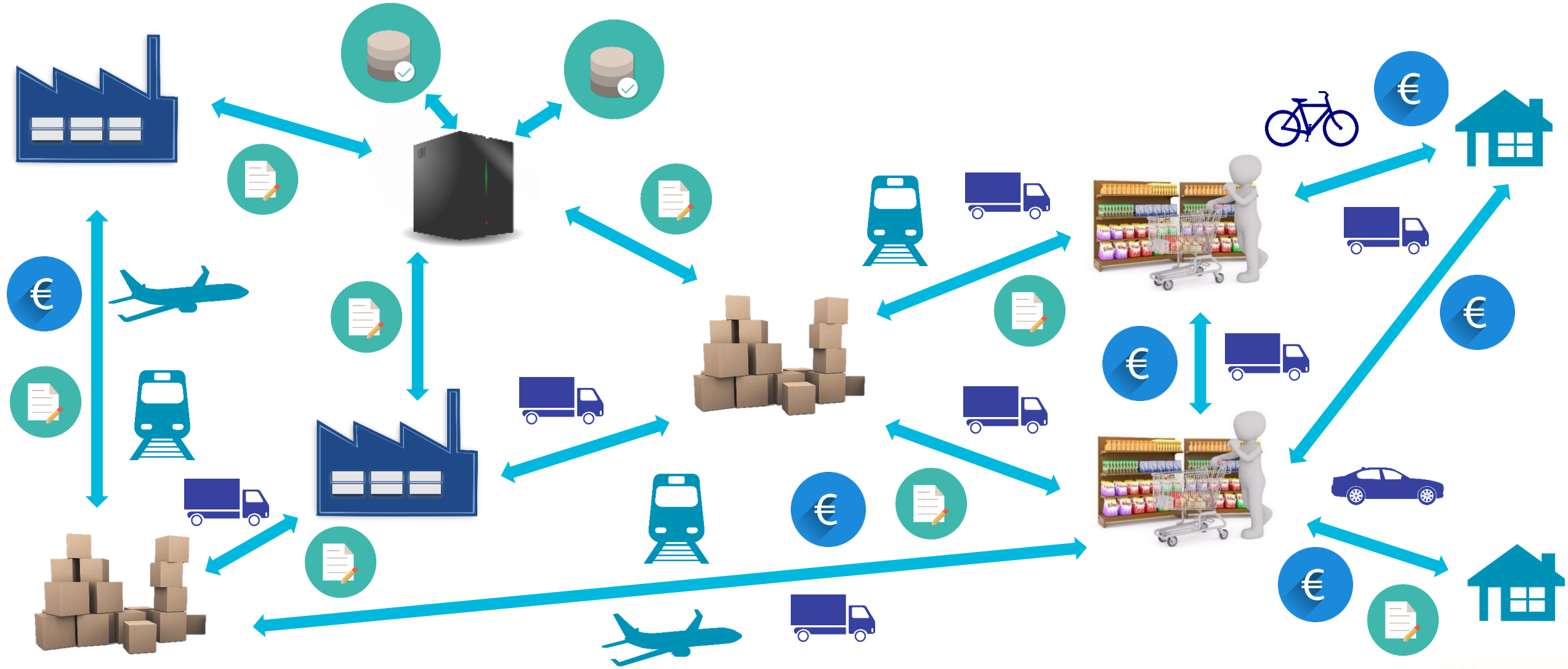
At this time Physical Internet research efforts have been focused on:
How to manage the Logistics Web operations (physical, information and money flows)?

Strategic

How to make sure the Logistics Web will be able to meet the demand in the forthcoming years?

LOGISTICS WEB

A constantly evolving network over time



Will the Logistics Web be able to meet the demand in the forthcoming years?

Is there risks for the Logistics Web to be unable to meet the demand in the forthcoming years?

How to identify the risks?

How to mitigate the risks?
Which strategic decisions to make (production capacity investments, new PI hubs, etc.)?

...

How

to help the Logistics Web actors

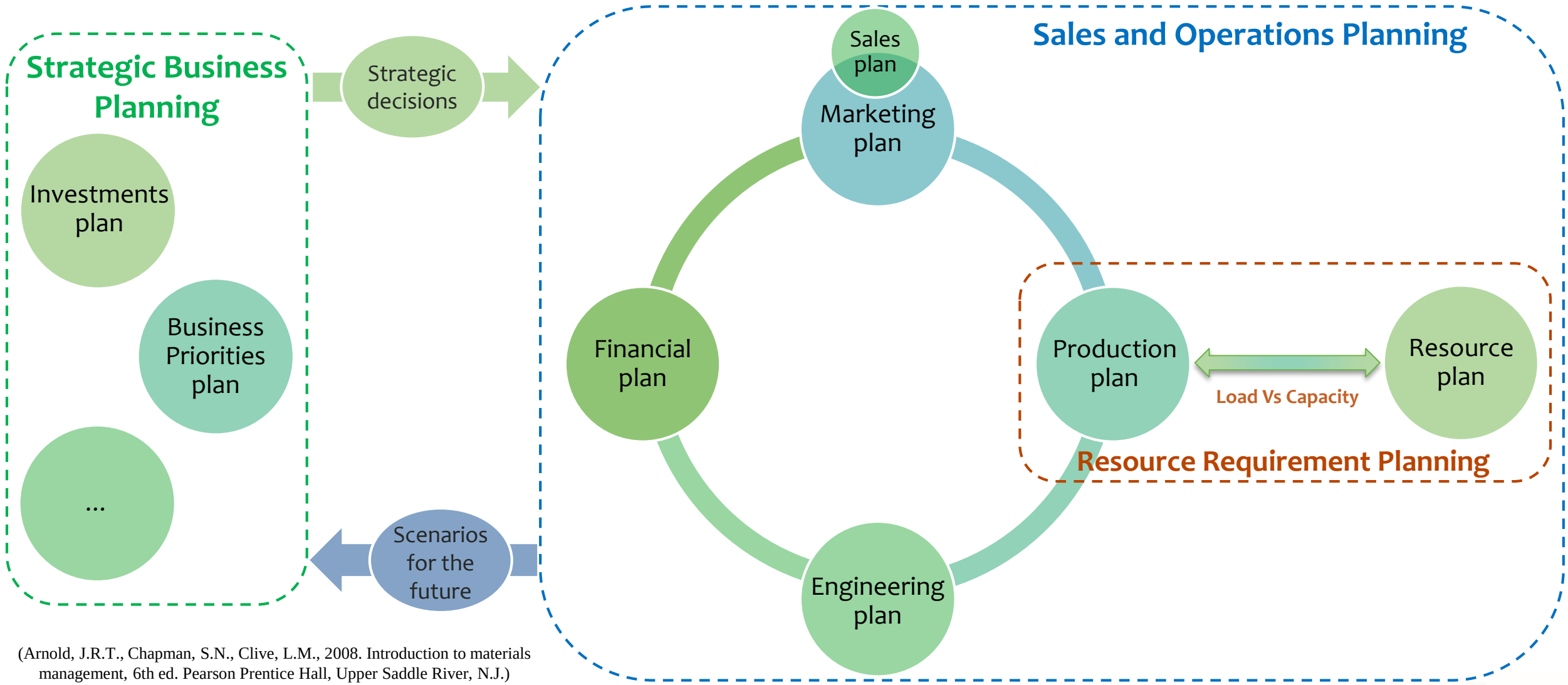
to make good strategic decisions

to mitigate the risks to be unable to meet the demand in the forthcoming years

?

CHALLENGING THE "MRP II" METHODOLOGY

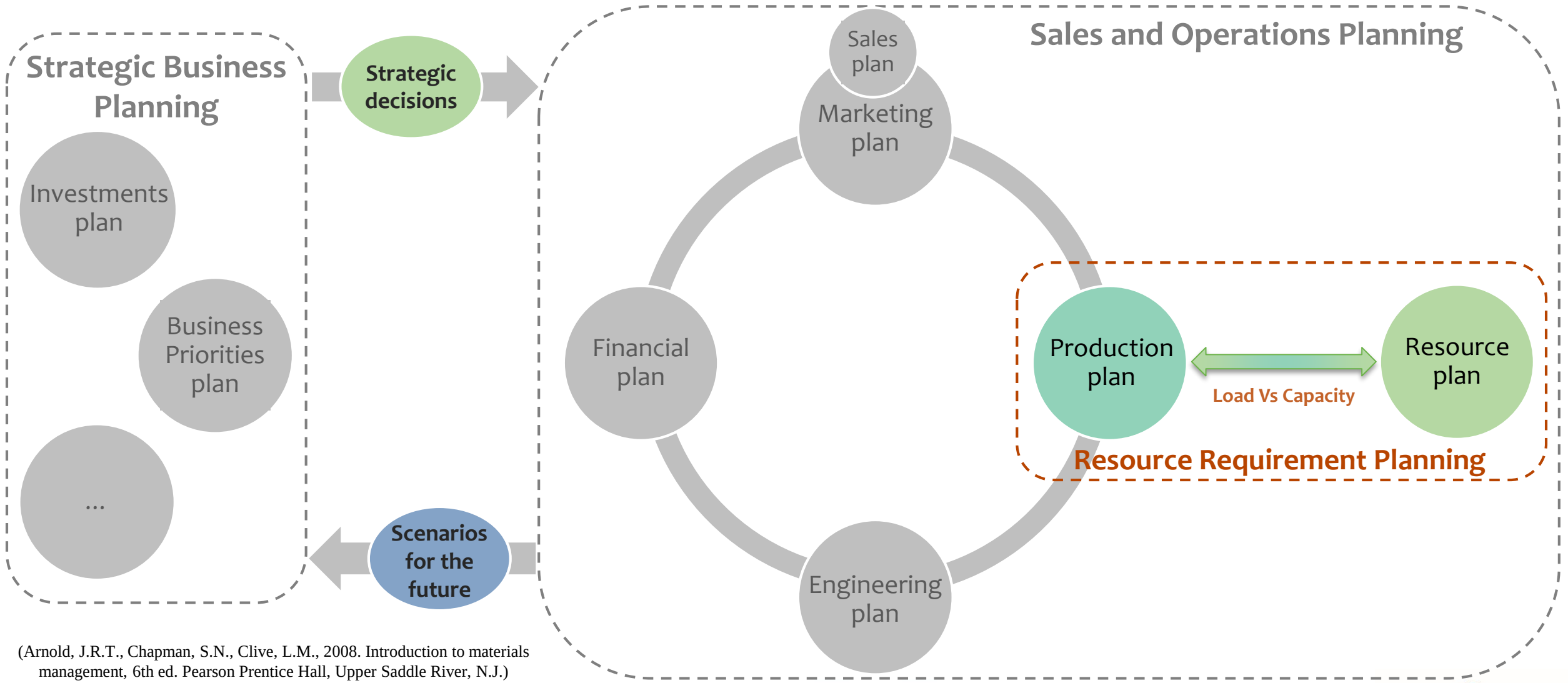
Strategic Business Planning & Sales and Operations Planning



(Arnold, J.R.T., Chapman, S.N., Clive, L.M., 2008. Introduction to materials management, 6th ed. Pearson Prentice Hall, Upper Saddle River, N.J.)

CHALLENGING THE "MRP II" METHODOLOGY

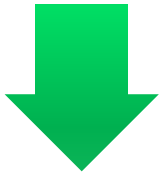
Strategic Business Planning & Sales and Operations Planning



(Arnold, J.R.T., Chapman, S.N., Clive, L.M., 2008. Introduction to materials management, 6th ed. Pearson Prentice Hall, Upper Saddle River, N.J.)

Making scenarios for possible futures

To support strategic decisions to secure the supply chains



To enable the business to fulfil the demand in the forthcoming years

Why do we need to make scenarios for the forthcoming years?

- Market variability
- Logistics Web uncertainty
- Supply Chains disruptions

CHALLENGING THE "MRP II" METHODOLOGY

Few problems with S&OP scenarios

Huge number of scenarios + Very time consuming to make scenarios → Only few scenarios are done in practice

Very dynamic environment + S&OP generally updated monthly → Scenarios are often outdated

Low visibility about n-tier suppliers + A S&OP for each business → Scenarios do not consider the overall SC

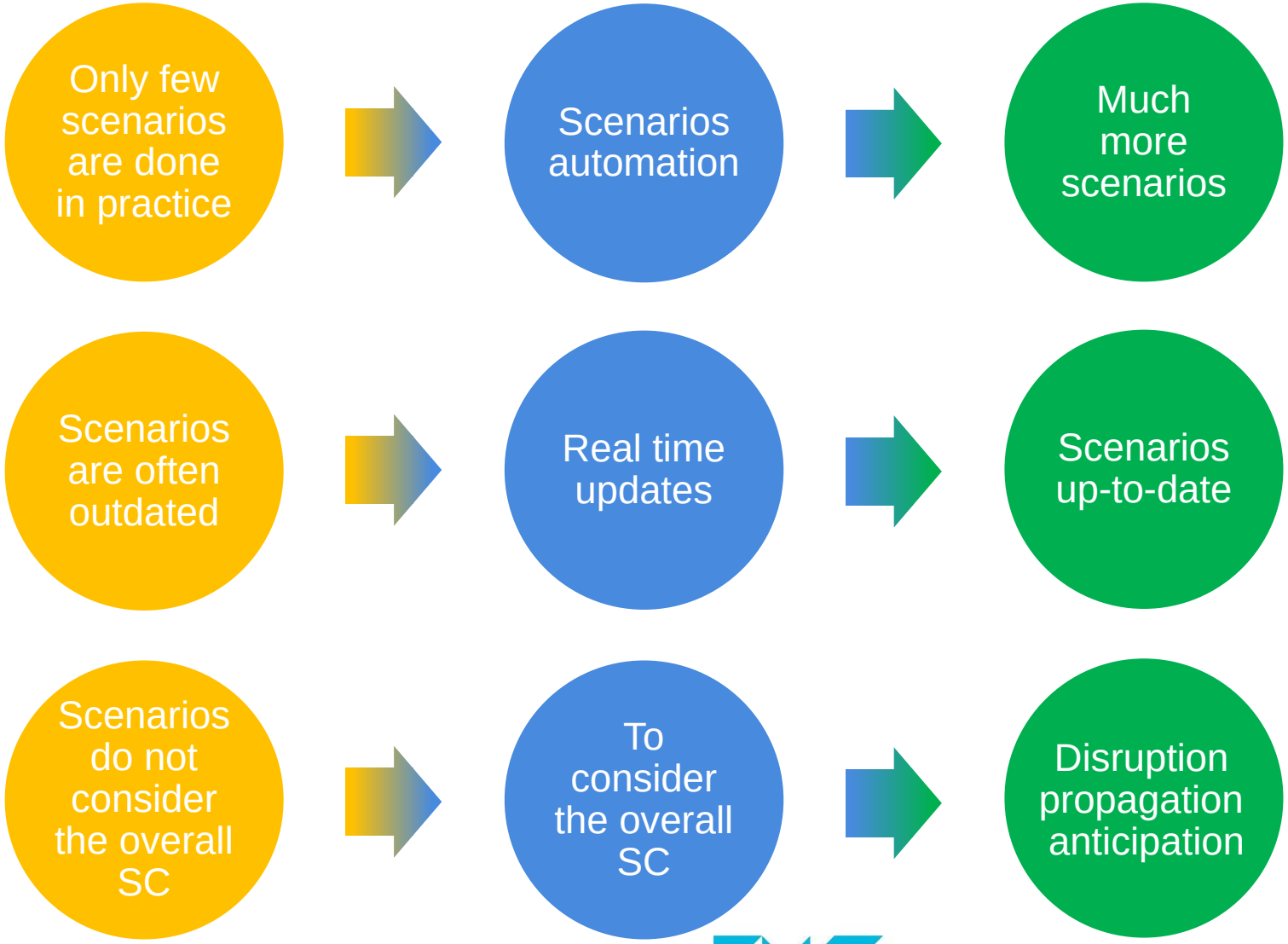
Only few scenarios are done in practice + Scenarios are often outdated + Scenarios do not consider the overall SC → Difficulties to get good visibility on possible futures → Difficulties to secure the supply chains

How to give businesses a better visibility on possible futures?

Difficulties to ensure the capacity to fulfil the demand in the forthcoming years

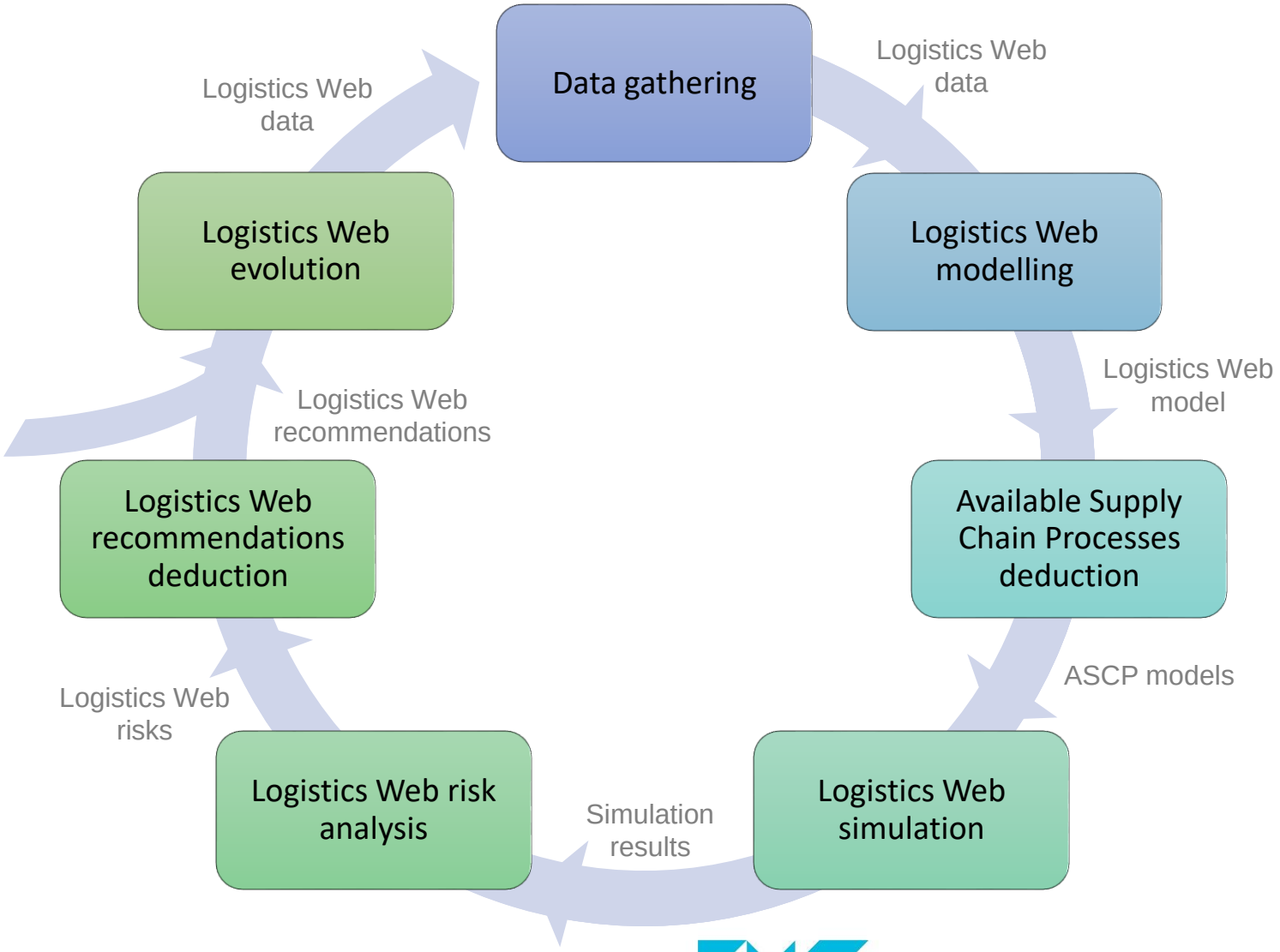
CHALLENGING THE "MRP II" METHODOLOGY

A need to adapt the S&OP process



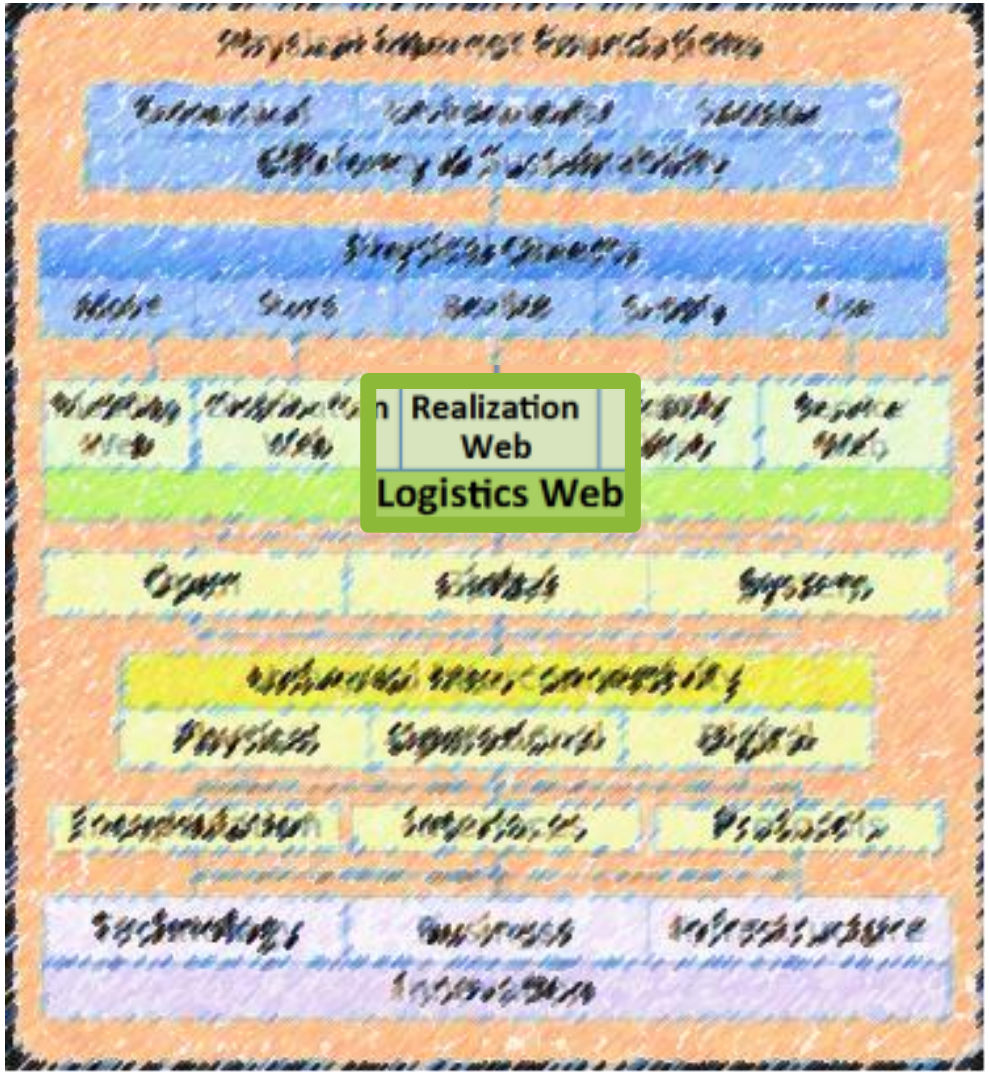
RESEARCH PROPOSAL

Towards a methodology and platform to support PI Logistics Web strategic decisions



FIRST APPLICATION: RIO-SUITE PLATFORM

Focus on the Realization web



How

to help the Realization Web actors

to make good strategic decisions

to mitigate the risks to be unable to meet the demand

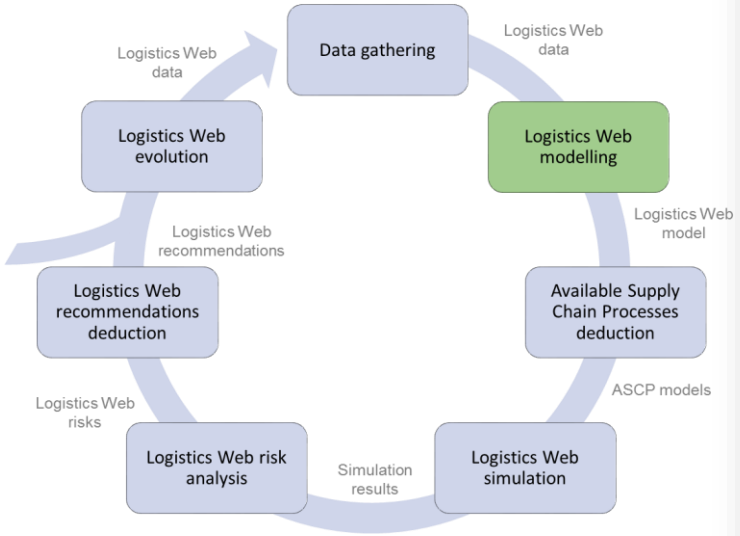
in the forthcoming years

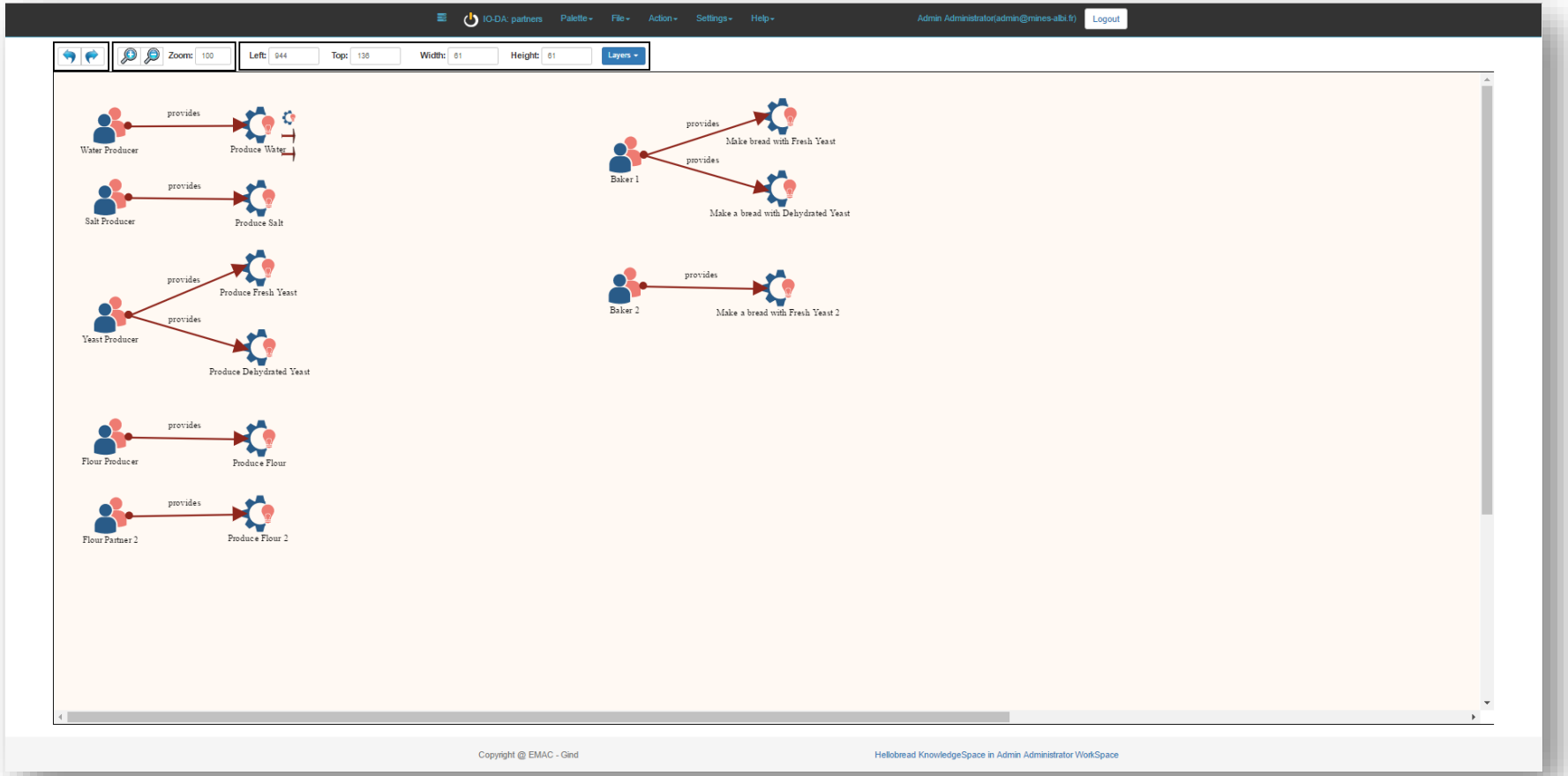
?

Montreuil, B., Meller, R.D., Ballot, E., 2013. Physical internet foundations, in: Service Orientation in Holonic and Multi Agent Manufacturing and Robotics. Springer, pp. 151–166.

FIRST APPLICATION: RIO-SUITE PLATFORM

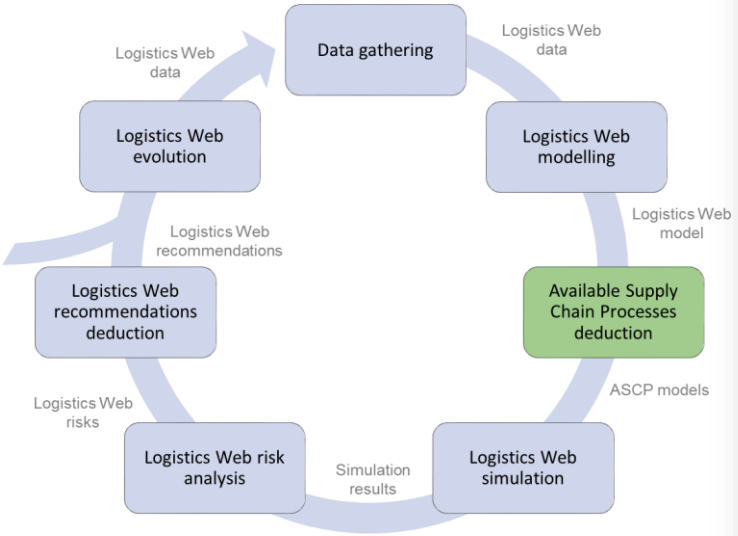
Realization Web modeling

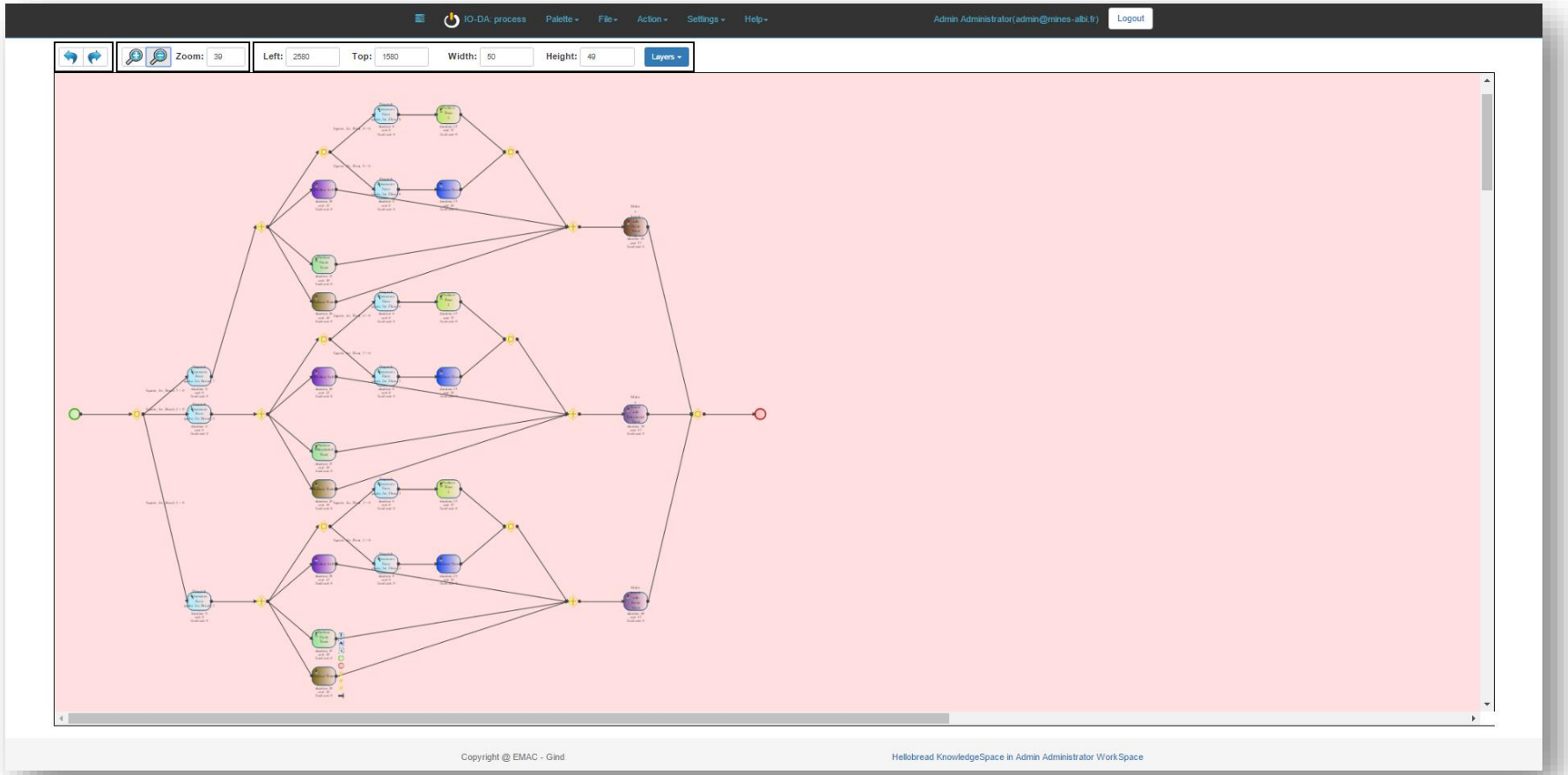




FIRST APPLICATION: RIO-SUITE PLATFORM

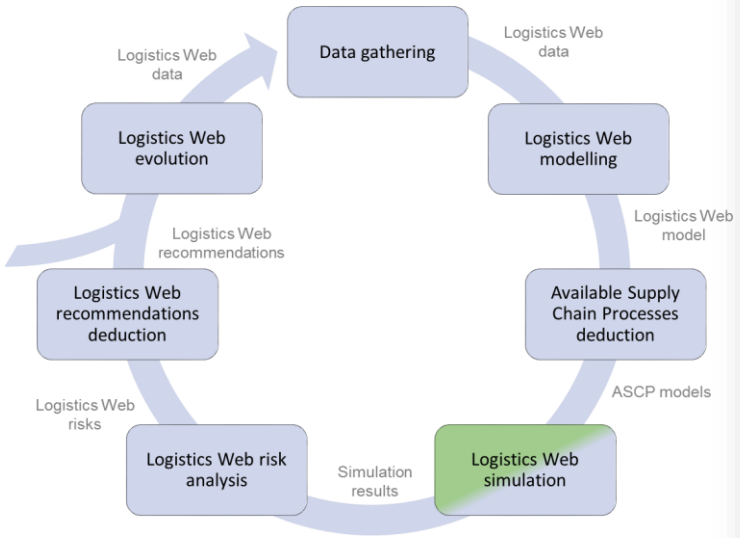
Available Supply Chain Processes deduction

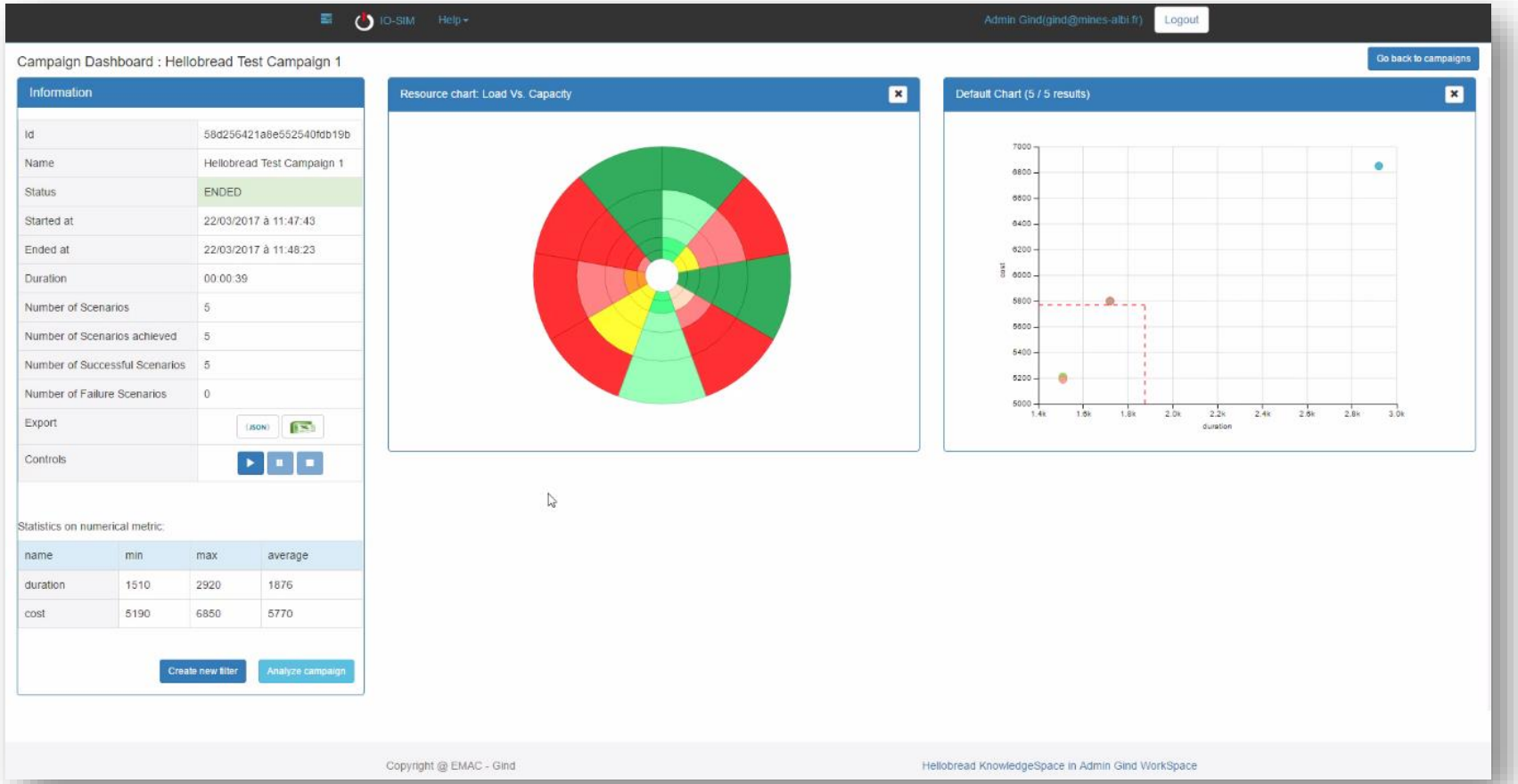




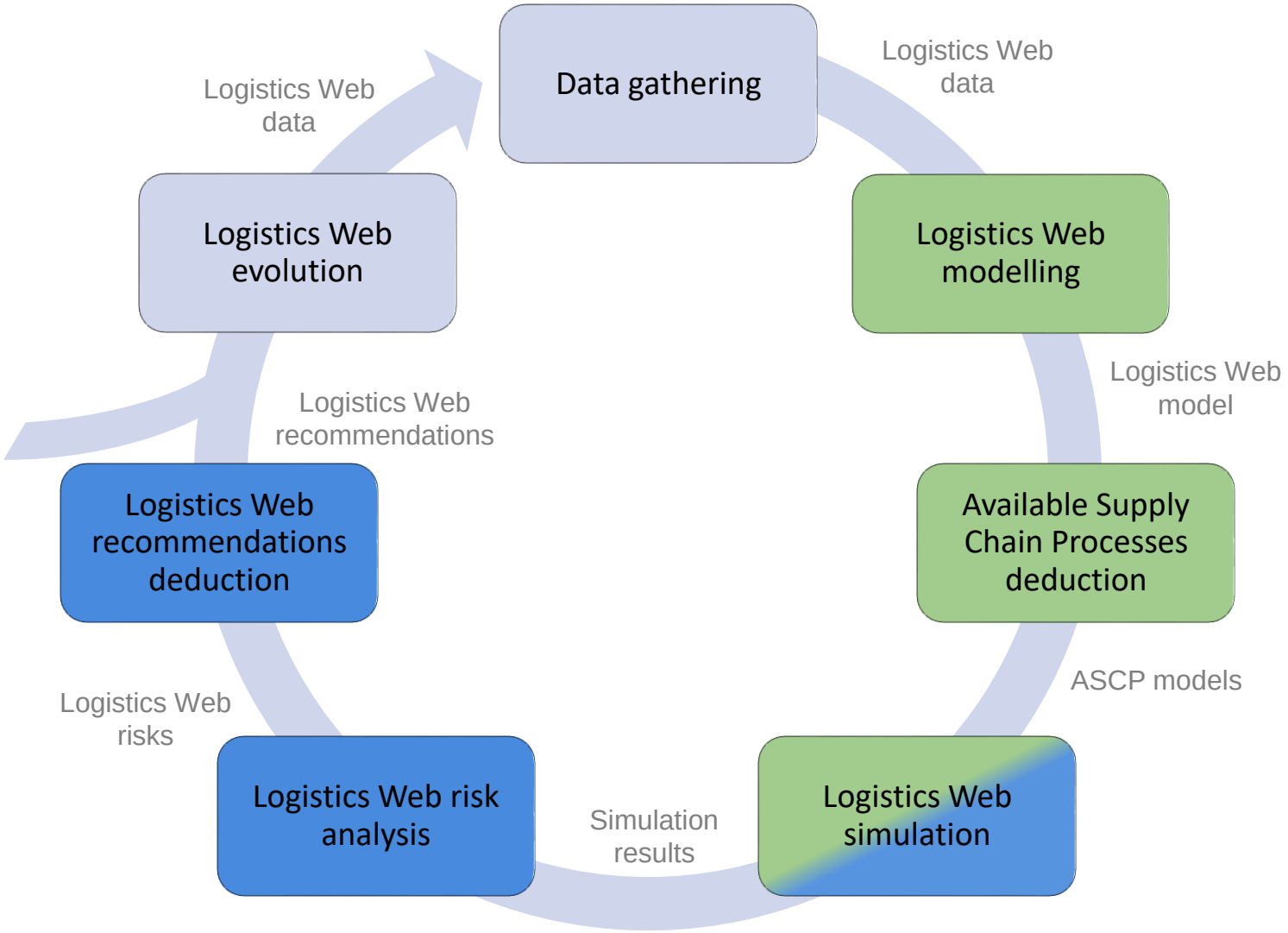
FIRST APPLICATION: RIO-SUITE PLATFORM

Logistics Web Simulations





RESEARCH AGENDA



IMT Mines Albi-Carmaux
École Mines-Télécom

Georgia Tech

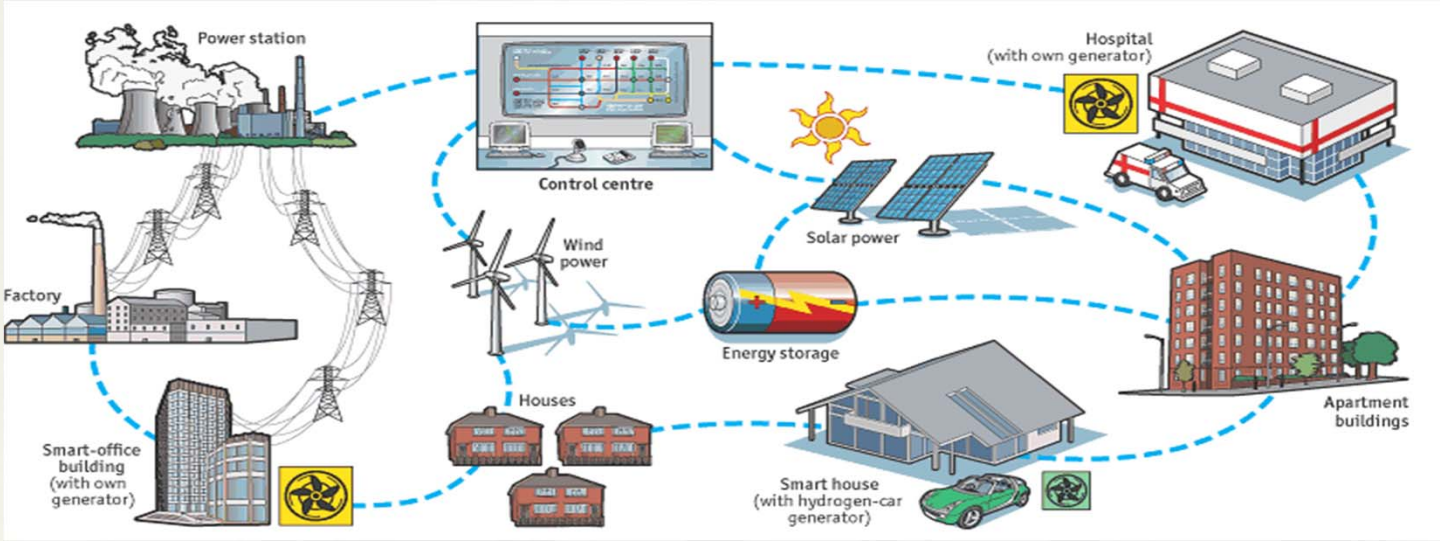
Pierre Fabre

ARMINES

With the support of the industrial research chair

Supply Chain Agile

raphael.oger@mines-albi.fr



Realizing Edison's Vision in the 3D Modern Era: Hyper-connected Modular Renewable Energy Production

Changliang Liu[1] , Suzanne Marcotte[2] , Grainne Lynch[3], Stephen Spulick[4]

1. CILT(London), CIRRELT and McGili, Montreal, Canada
2. Department of Management & Technology, Université du Québec à Montréal, Canada
3. The Chartered Institute of Logistics and Transport, Ireland
4. U.S. Army Medical Materiel Agency, Maryland, United States of America

Physical Internet
Efficient Sustainable Logistics

4th INTERNATIONAL PHYSICAL INTERNET CONFERENCE

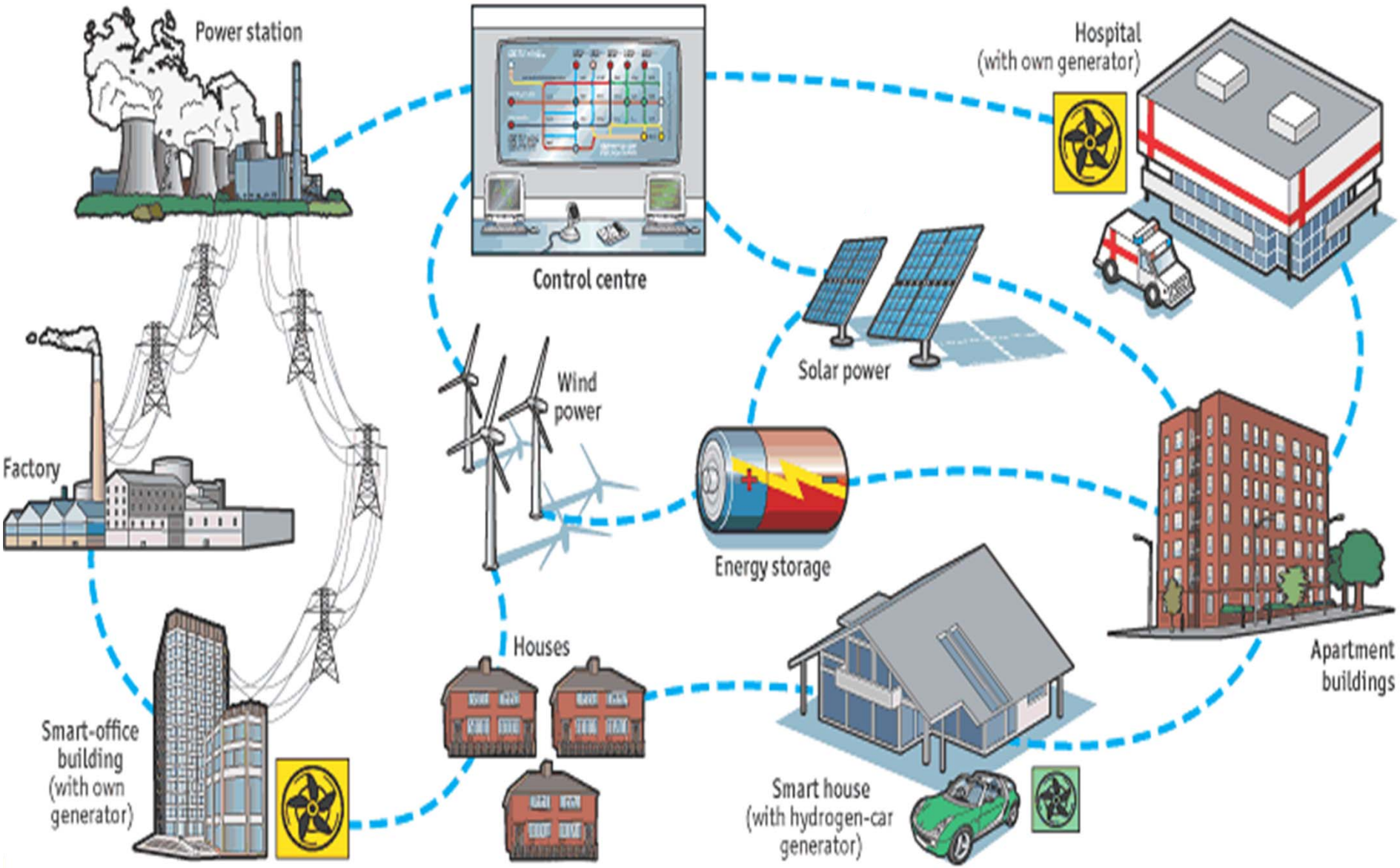
UQÀM Université du Québec à Montréal

4th-6th July, 2017 in Graz: Graz University of Technology, Austria

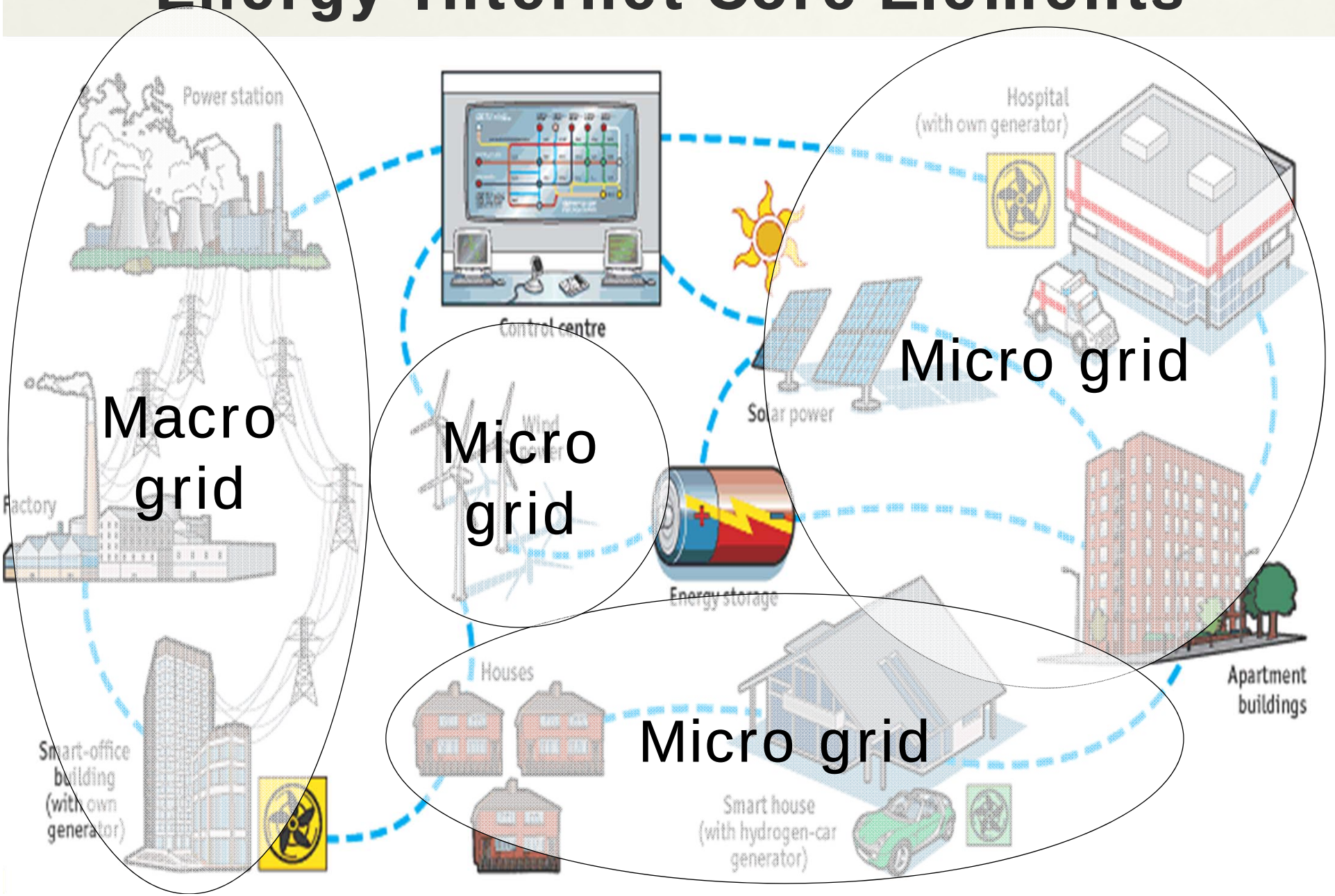
Agenda

- **Introduction**
  - Problem statement
  - Brief history of RE
- **Analysis**
  - RE Supply chain
  - Cases study
  - Obstacles and challenges
  - Related Work
- **Future research**

Energy Internet Core Elements



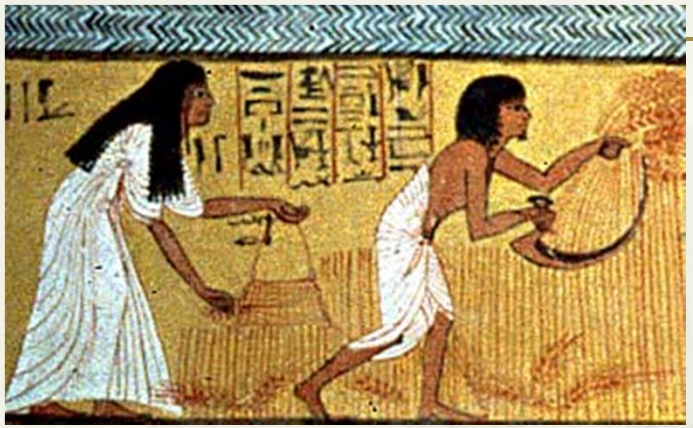
Energy Internet Core Elements



Problem Statement

- Problem
  - Mismatch supply and demand
- Objective:
  - How to optimize the network flows
    - Constraints
- Research
  - Study pros and cons
  - Describe the network
  - Cases study

Early Times: Sources of Energy

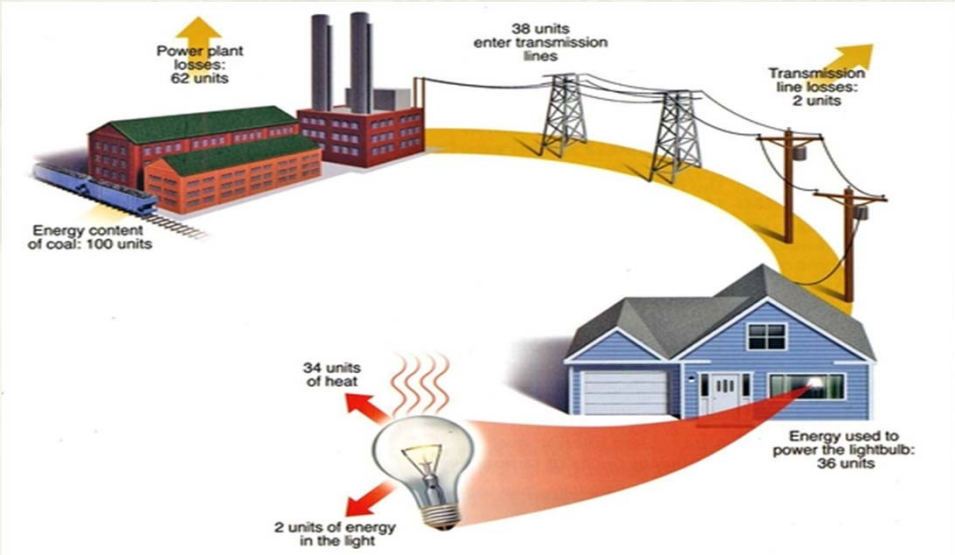


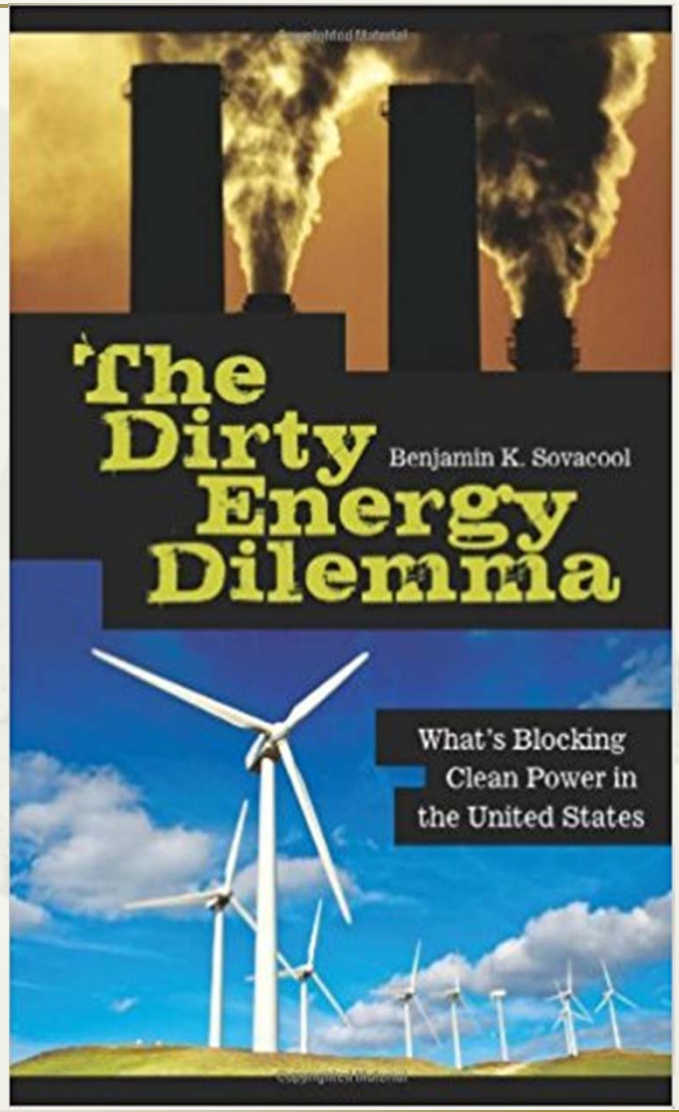
Characteristic of Renewable Energy

* It was almost all local
* It was almost entirely renewable
* Would sustain a limited population indefinitely

Conventional Energy Dilemma

- Weather and human error blackout
- Mismatch supply with demand
- End-consumers' little control
- Delayed maintenance response
- Huge cost from macro-grid network





Era of Base-Cost Renewable

Weakness of capacity market (central planning)

- Over procurement:
  - inaccurate predictions of supply and demand
- Political risk aversion
- Innovation suppressed by: Artificially-shaped demand
- Bias towards incumbents
- Picking of winners

Era of Base-Cost Renewable

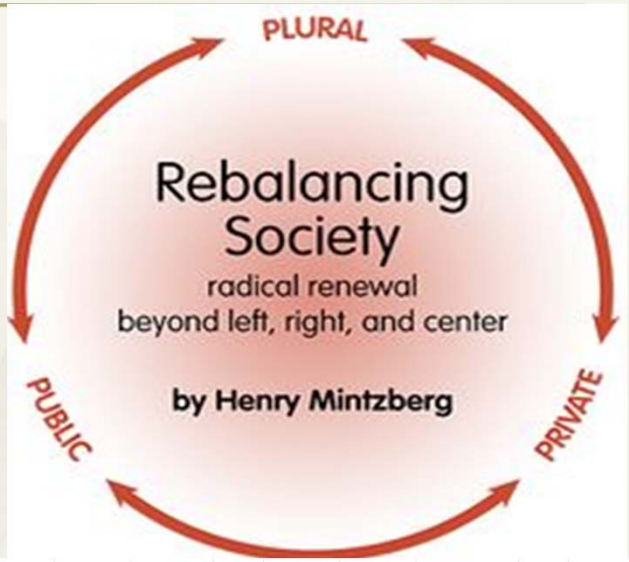
Strength of Demand-led flexible market

- Competitive, technology-neutral, liquid markets across location and time
- Reliability standards at the retail level
- Carbon regulation via carbon price, carbon intensity or retirement schedule
- Flexibility costs charged to those who cause them
- Certificates of origin for imported power
- Cost of stability-related ancillary services borne by TSOs and DSOs

Plural Economics Emerge

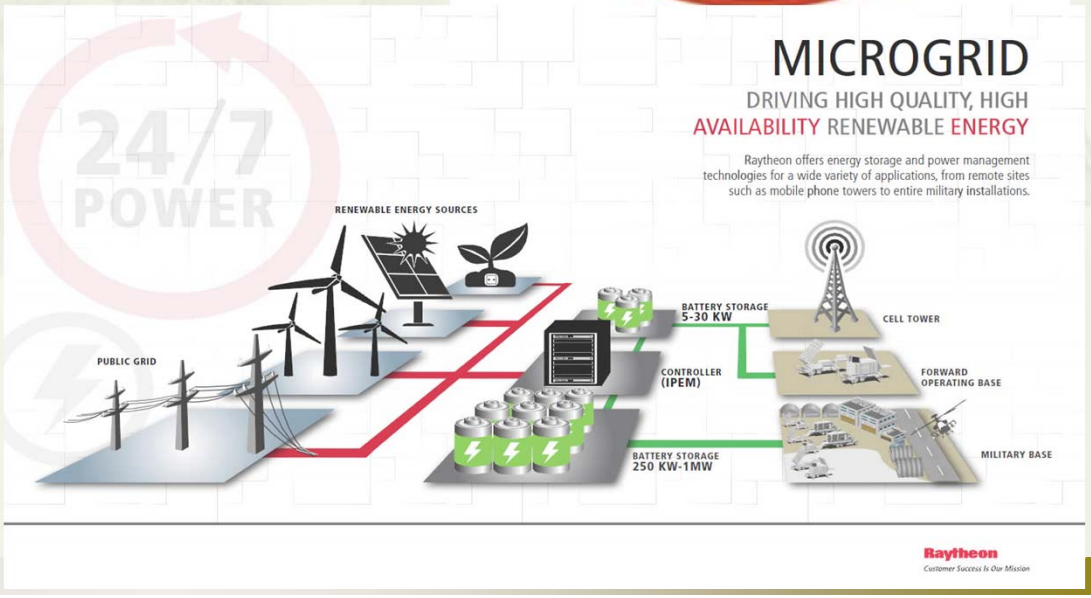
Plural economics

- Moving away from purely public infrastructure
- Technology is moving faster than regulation



E-mix Times

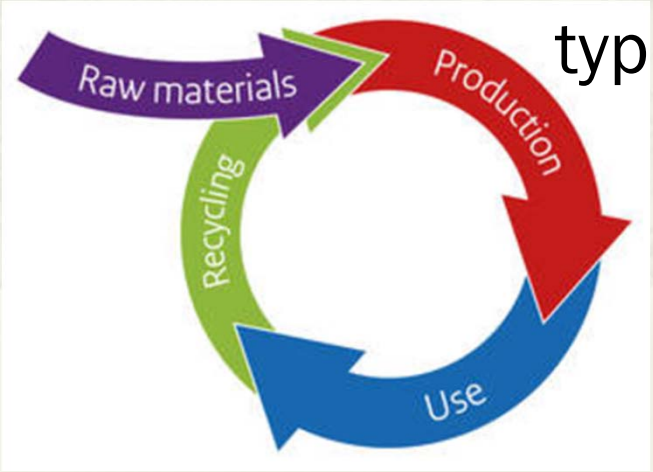
- Sharing micro-grid
- Macro-grid on demand



Circular Economy and Sharing Economy

Circular Economy

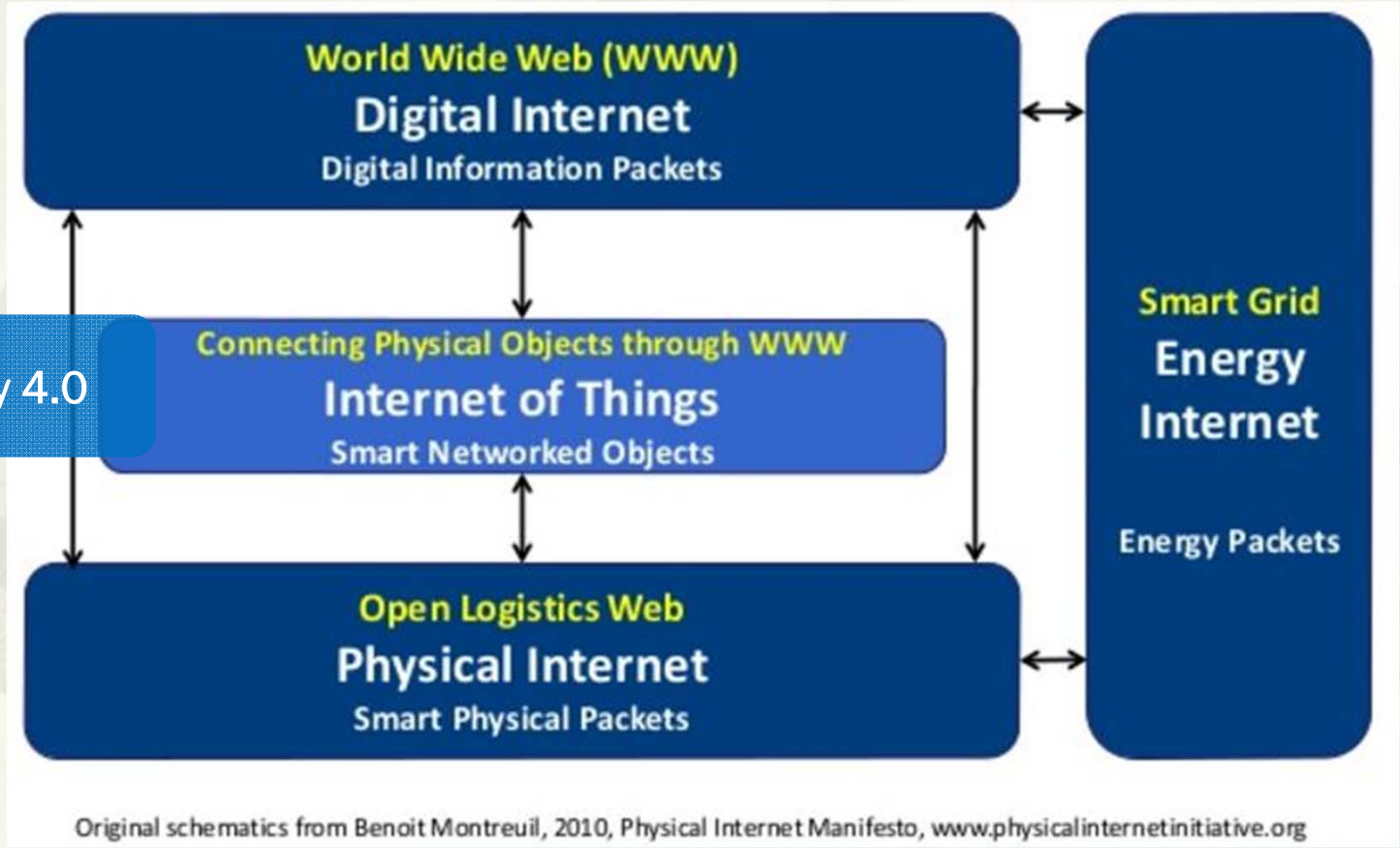
* Regenerative system
* Products designed to be reusable
* Products and raw material reused
* Respect of the environment



Sharing Economy

* Economic system
* Assets or services shared between private individuals
* Either free or for a fee, typically by means of the Internet

The Internet's' and Industry 4.0



Original schematics from Benoit Montreuil, 2010, Physical Internet Manifesto, www.physicalinternetinitiative.org

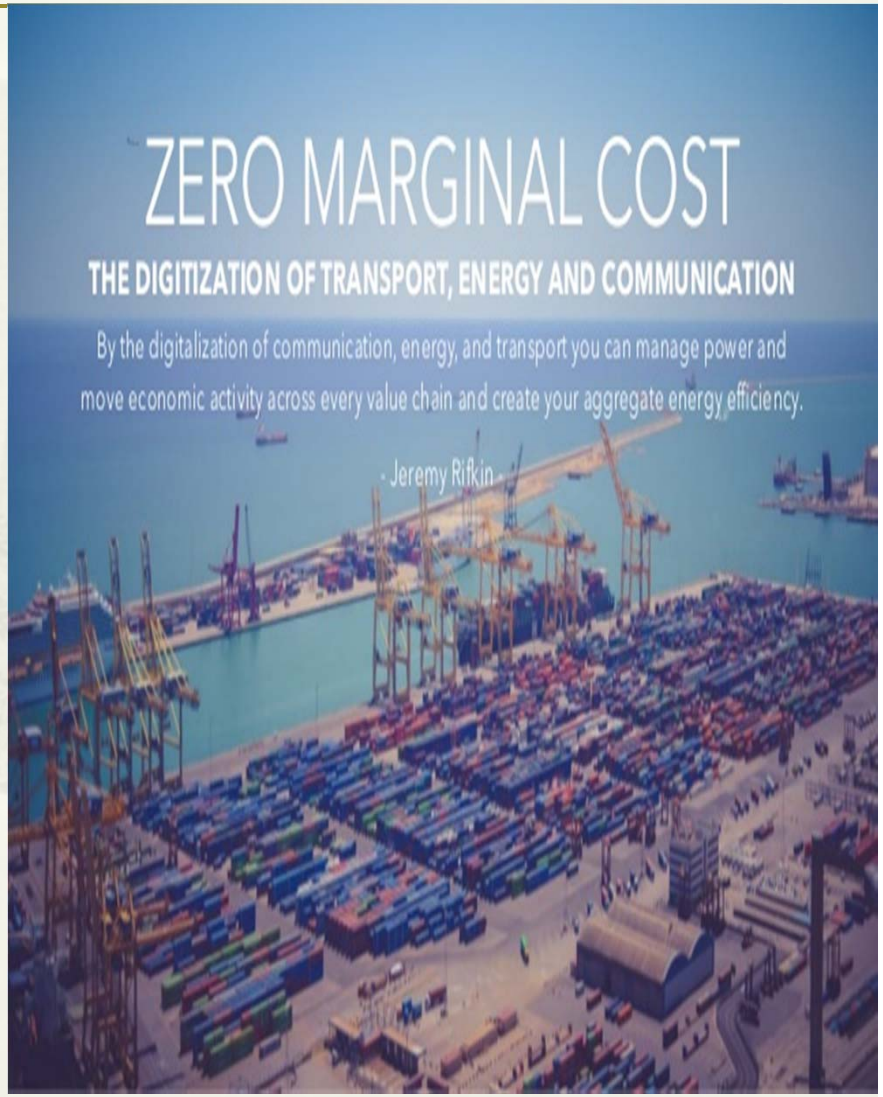
Energy Internet Core Elements

* **Collaborative Commons**

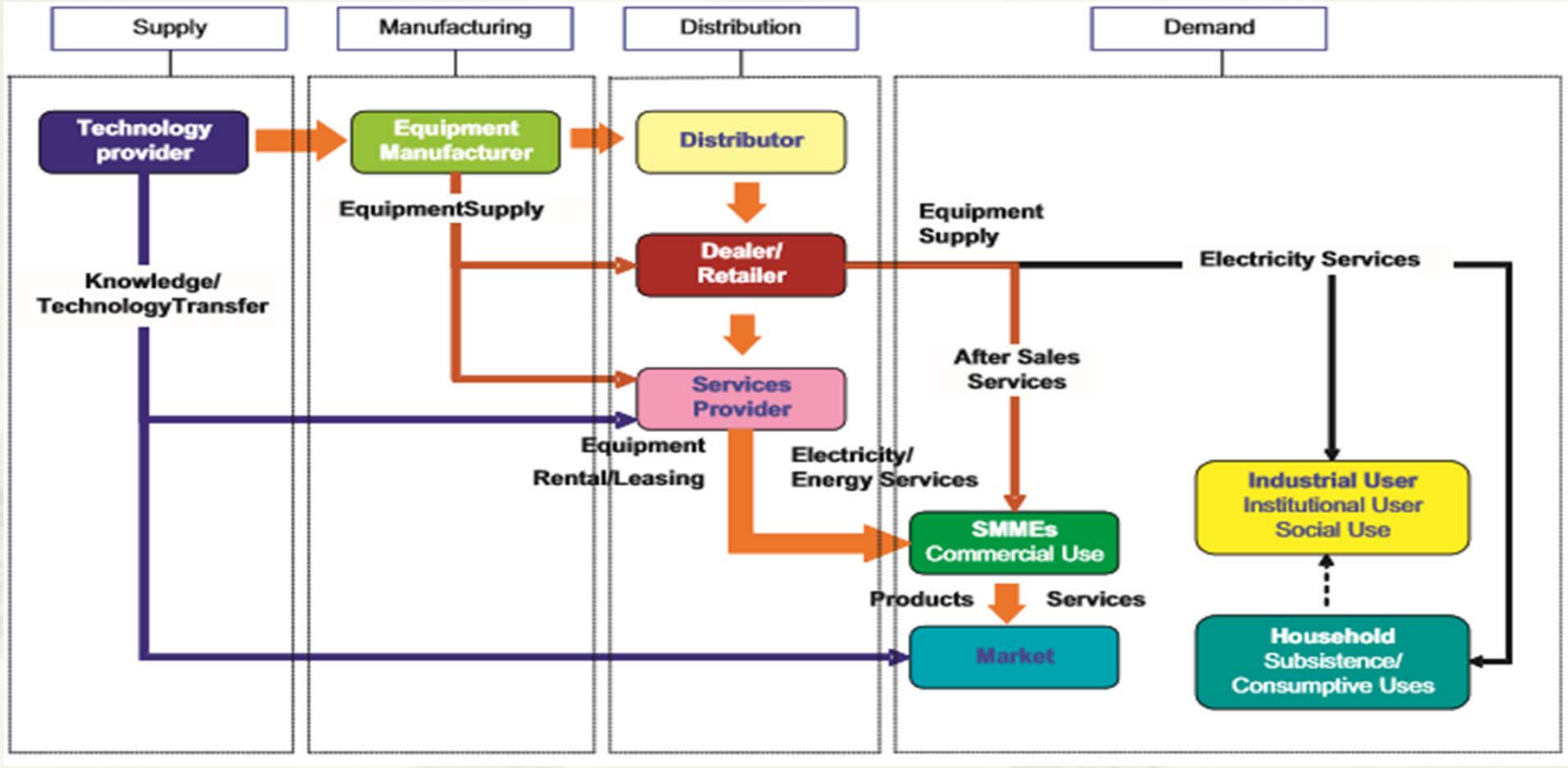
  Jeremy (2014) defines the Energy Internet:

  A dynamic, distributed, redundant and multi-participant energy network built around clean energy generation, storage and delivery and serving as the foundation in the zero marginal cost society.

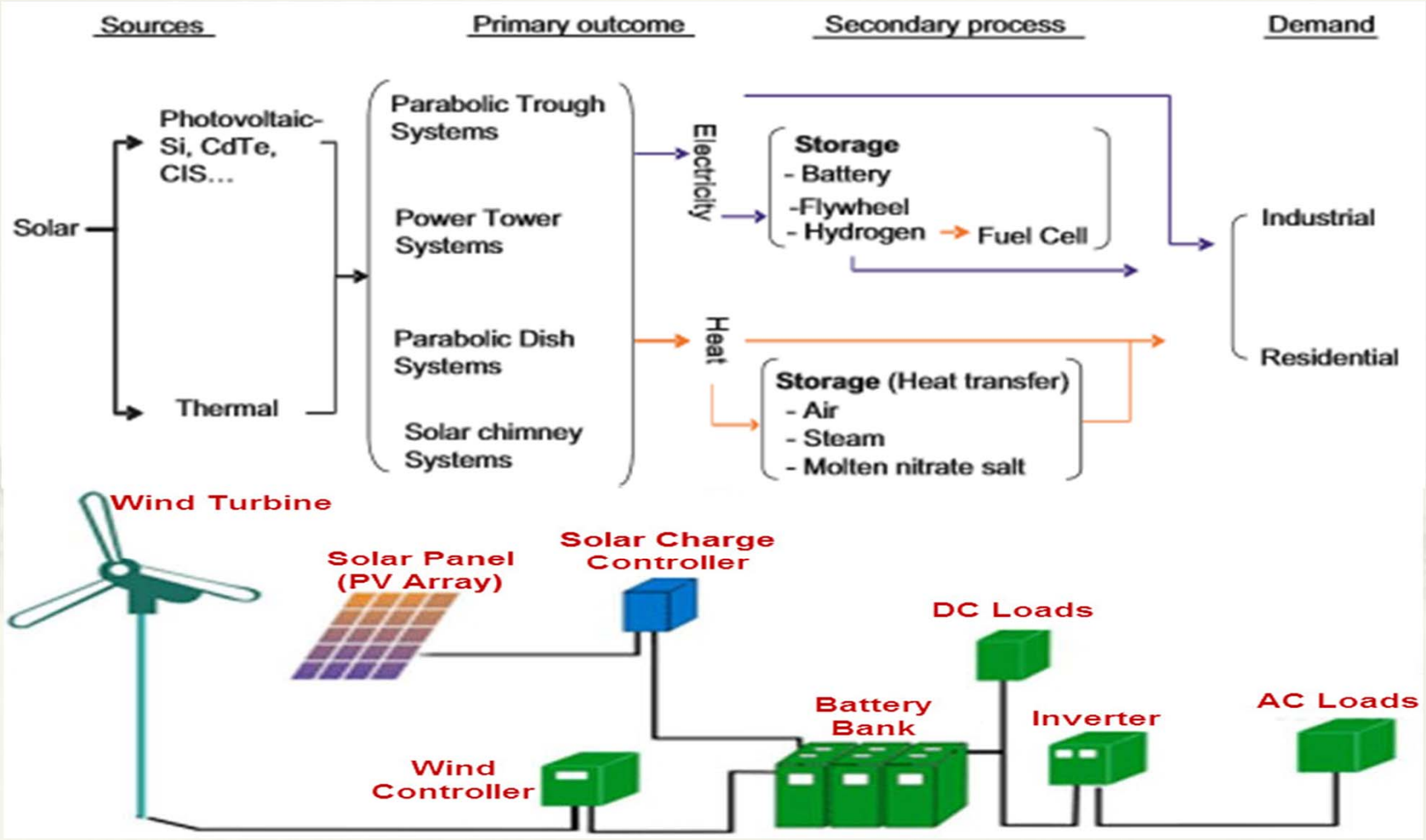
* **Energy Prosumers & Storage**



Renewable Energy Supply Chain Process



Renewable Energy Generation Flow



Key Findings across RE Value Chain

	Supply	Production	Distribution	Demand
Input (constraints and characteristics)	Technology limits Intermittency Variability Maneuverability	O & M costs High investment Cost too high Technology limits		Government policy Substitution effect
Indirect goals	Land usage Water consumption	Employment	Employment	Social impacts
Direct goals		Location Conversion efficiency	Distribution efficiency Storage	Environment impacts

China & US: Cases Study

China

* Global Energy Interconnection Initiative (macro-grid)

  Building Global Energy Interconnection for a community of common destiny for all mankind

* Himin Micro-emission Earth Strategy (micro-grid)

  Climate Mart worldwide chain for the blue sky and white cloud

USA

* TESLA vertically Energy Network & Giga-factory

  Electricity produced by utility-scale solar facilities is now as cheap or cheaper as new gas or coal-fired facilities

* Brooklyn Micro-Grid (BMG)

  A network of energy relationships that supports locally generated renewable energy

E-macro vs E-micro vs E-mix

China	China	USA	USA
Geidco	Himin	Tesla	Brooklyn Microgrid
High voltage transmission	Sustainable lifestyle on solar	Giga-factory within solar industry	Co-op business model across micro-community
NGO	Private	Private	Private
One Belt One Road	Micro emission Earth Strategy	Solar energy with EV and Smart home	DRE practice based on bottom up approach
Macro-grid	Micro-grid	Macro-grid	Micro-grid

Global Energy Interconnection Development and Cooperation Organization
全球能源互联网发展合作组织

Hi-MIN SOLAR

TESLA
SolarCity

BROOKLYN MICROGRID

Obstacles & Challenges in USA

* The outdated transmission system.
* Peak output (solar and wind farms) often wasted.
* More and better electricity storage urgently needed.
* US federal efforts to thwart clean energy programs, numerous Republican-controlled state legislatures are considering legislation to reduce or eliminate funding for renewable energy incentives and initiatives.

Obstacles & Challenges in China

- **Mindset shift**
  - Prosumer as a partner
  - Deliver the service rather than product
  - The Transformation from Ownership to Access
- **Technology evolution**
  - Artificial Intelligence in the energy service supply chain
  - Redefine the market and revolutionize with collaborative commons mindset

Obstacles & Challenges in China

- **Policy upgrade**
  - Energy industry is moving away from purely public infrastructure and technology is moving faster than regulation in the 21st century

RE Market & Business Model

RE Market

- More for less as the story of RE in 2016
- RE (excluding large hydro) accounted for 53.3% of the new electricity generating capacity added worldwide in 2016
- Sitting of two different technologies (hydro-solar, wind-solar and PV-solar thermal) in the same location

Business model

- Energy management and utilization improvement solutions
- Decentralized energy production in mobile and open-fabs
- Not-for-Profit Business Model: A system based on shared interest, not self-interest

ISO & Major Debates in Energy Industry

ISO 50001

An energy management systems standard to reduce costs and carbon emissions

Major debates

Technocratic side: about tweaks and modifications to the current regulatory system

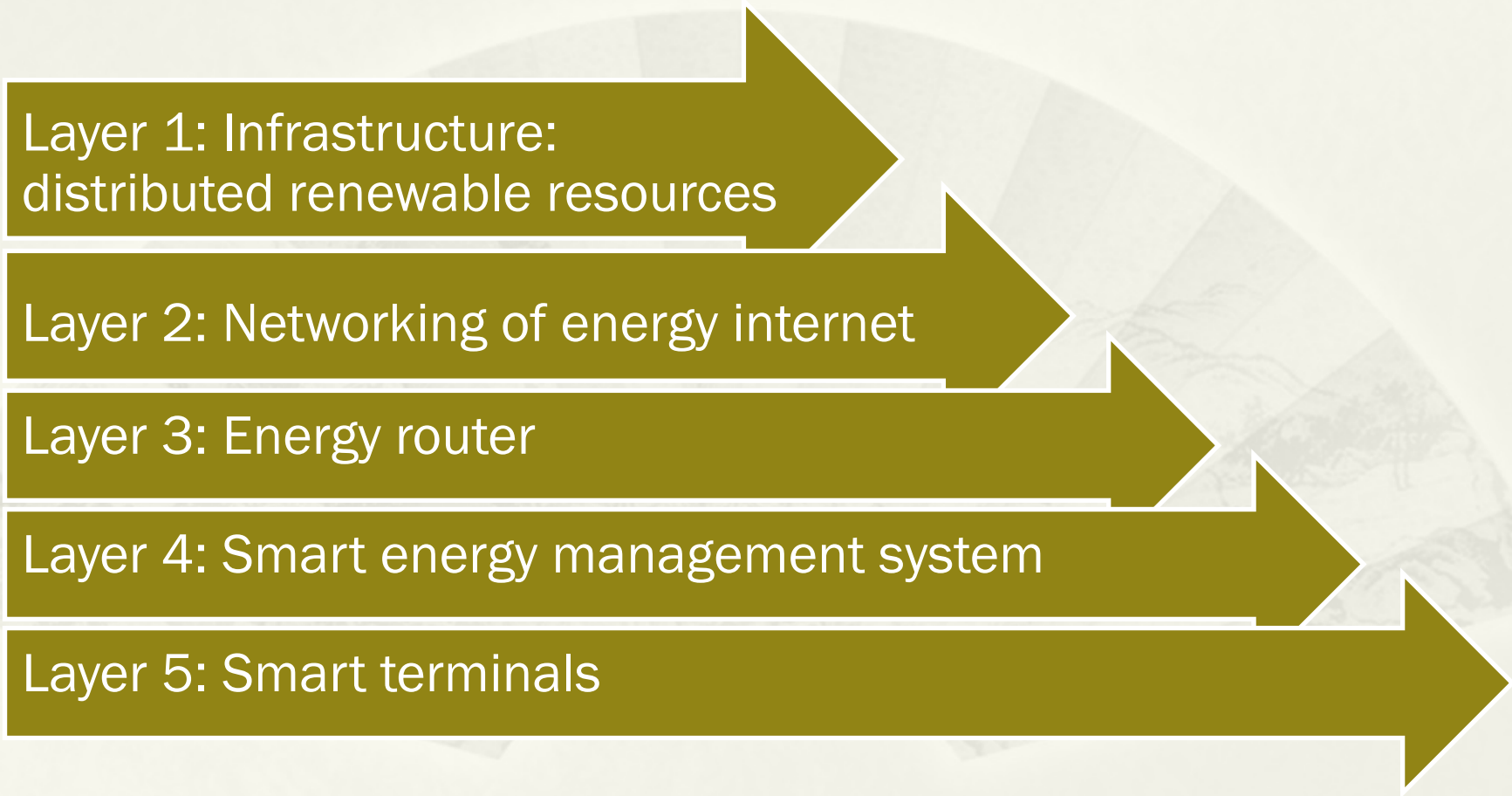
ISO & Major Debates in Energy Industry

Existential side: Nature of deep re-regulation required to meet the long-term challenge of the energy trilemma:

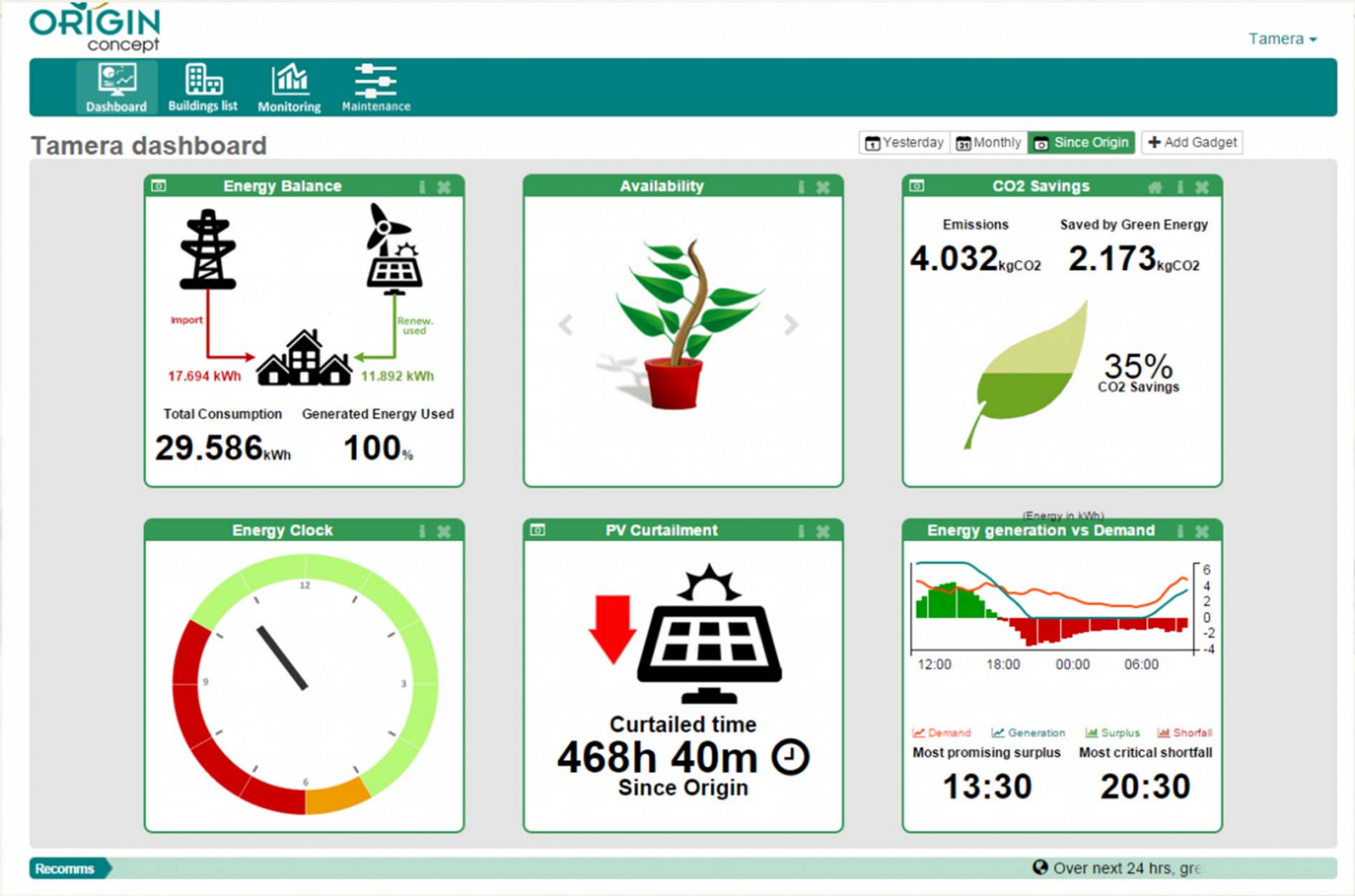
* provide cheap, clean, reliable power in the face of new technologies
* new types of user behavior and the all-encompassing need to address climate change

The key to cheap, resilient, clean energy lies in the ability to put together the perfect portfolio of different types of power

Clean Energy Internet System Architecture

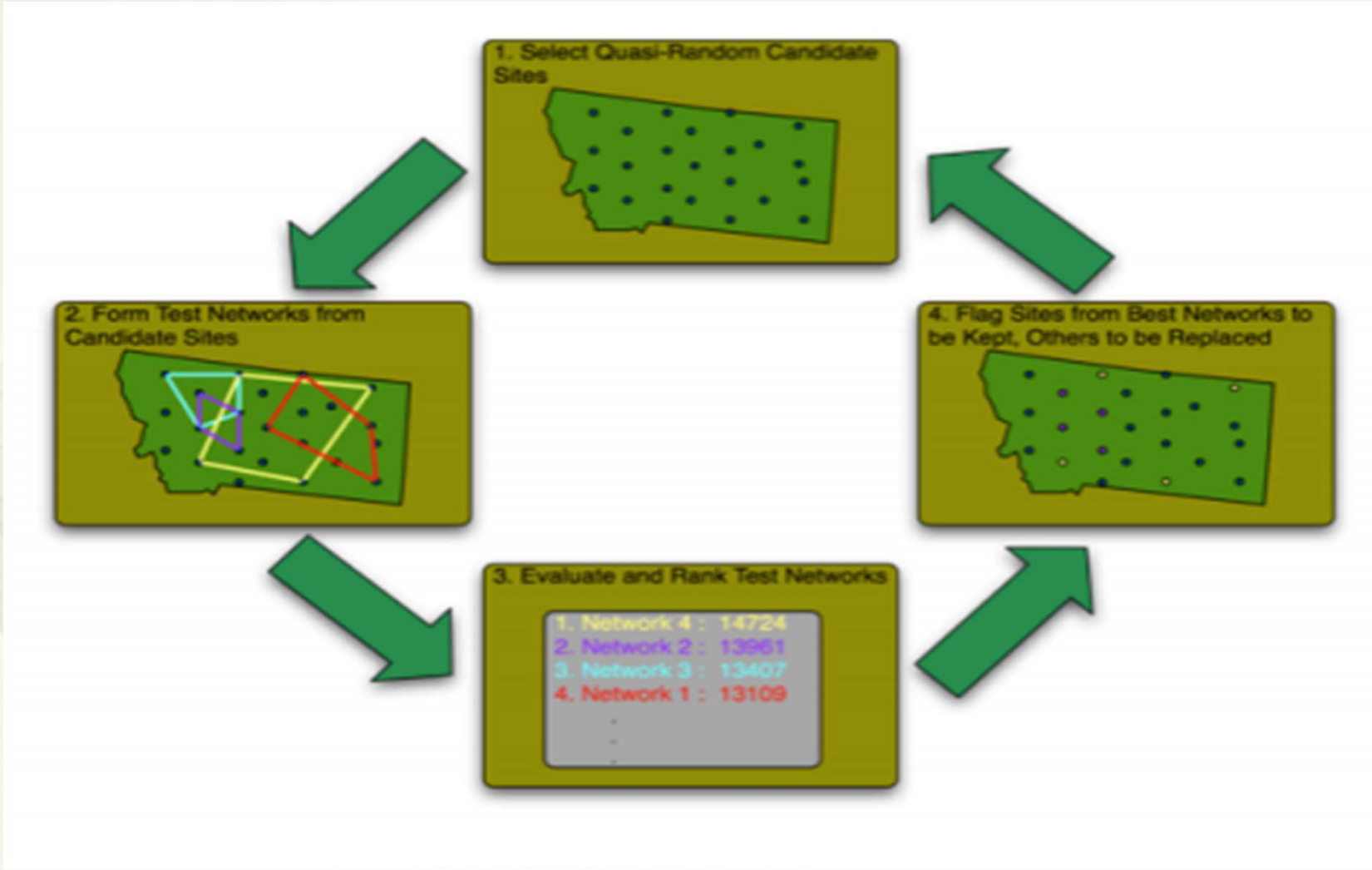


Dashboard for Prosumers

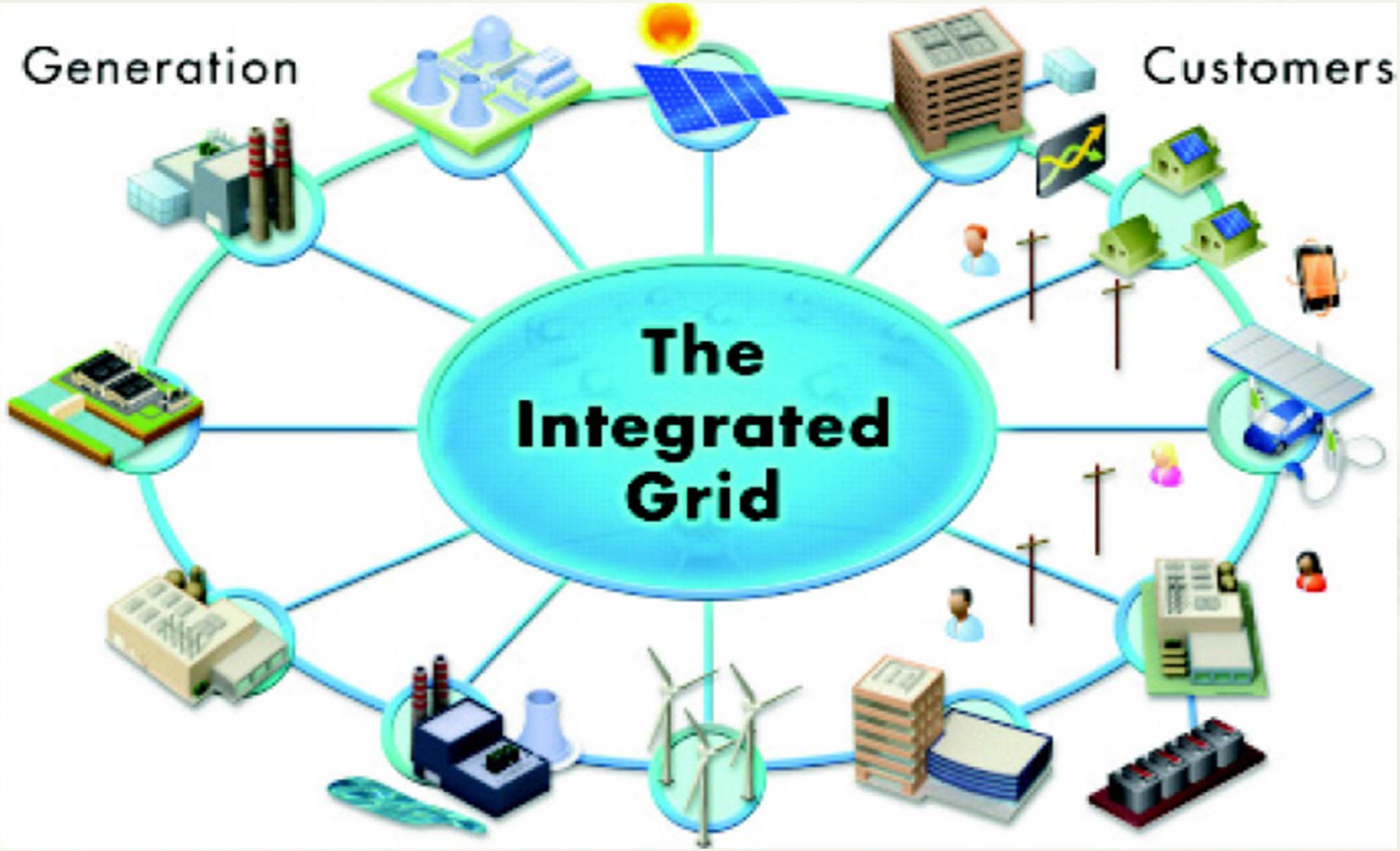


RE Network Optimization

Renewable Energy Network Optimization Tool (ReNOT)



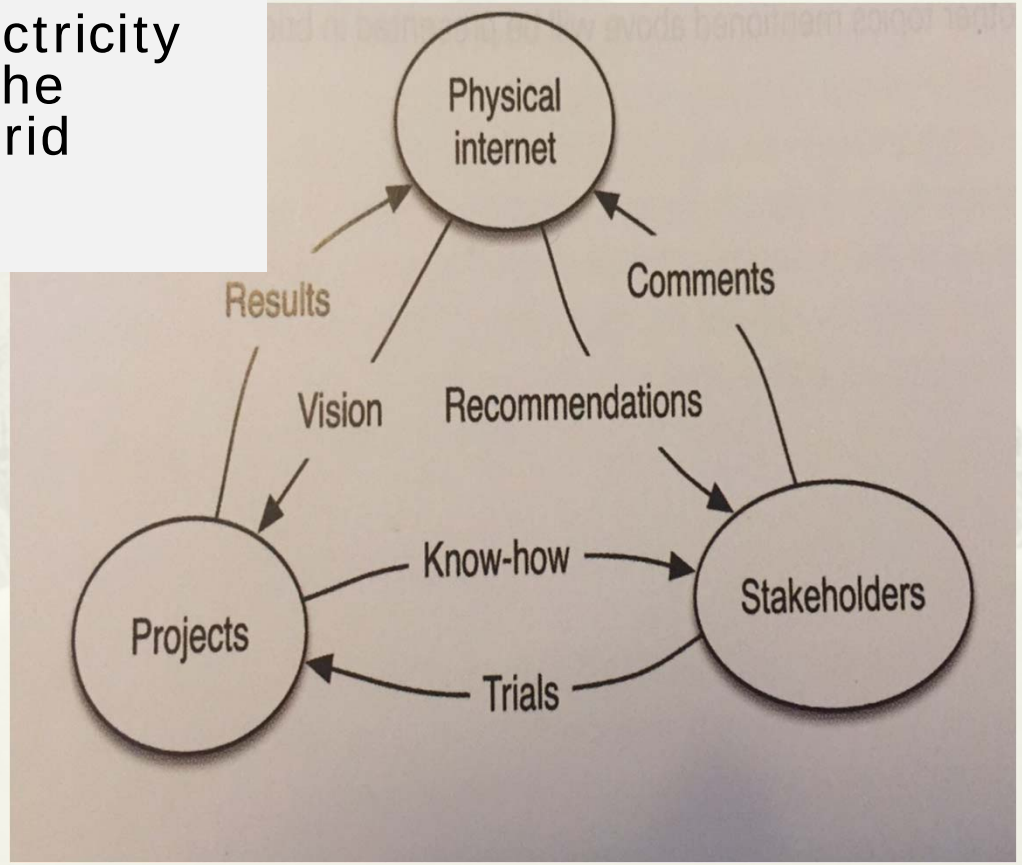
Decentralized Energy Infrastructure Emerges



McGili R&D Pilot: Exploiting Physical Internet for RE

Research

* Fundamental research
* Think Aggregation, think bigger
* Modeling the price in electricity markets must consider the physical impact on the grid

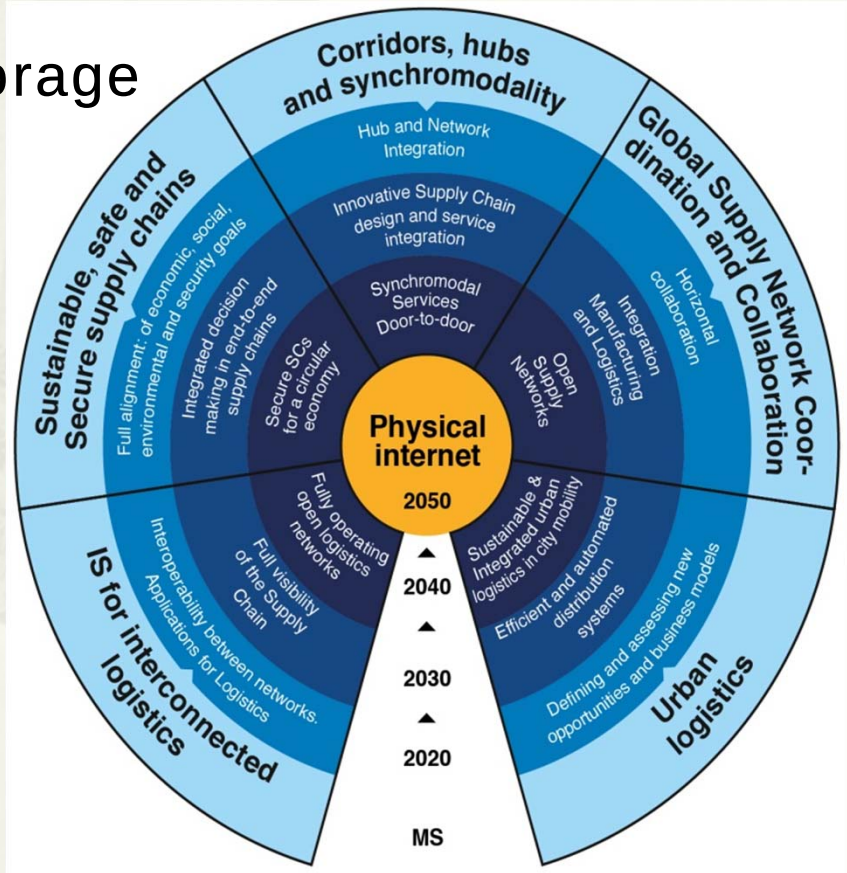


McGili R&D Pilot: Exploiting Physical Internet for RE

Development

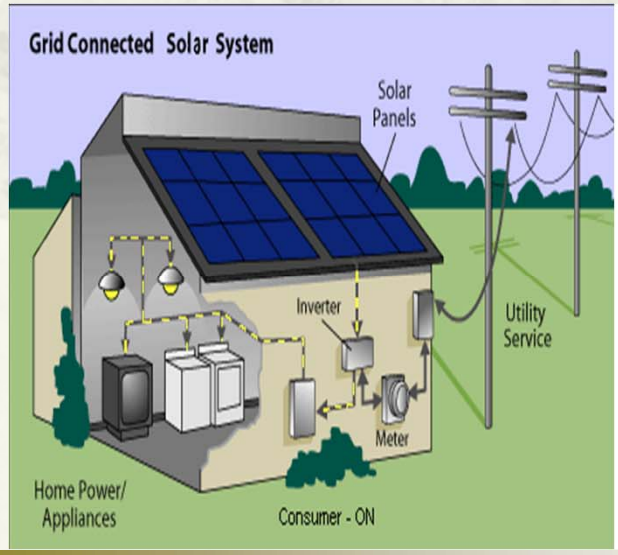
- Solar energy system (Himin & Renewz)
- Electric vehicles & energy storage (UoM)
- Artificial Intelligence (MILA)

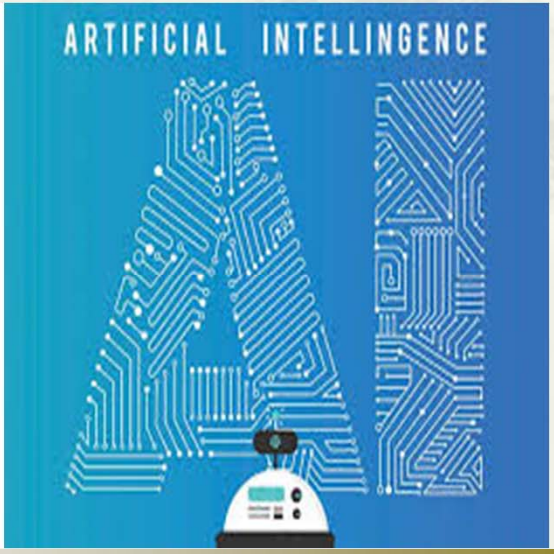
Think
smooth,
faster,
higher and
stronger!



Solution:
RE System + Energy Storage + AI

* Integrating intermittent renewable-energy supplies into existing electricity grids in a stable way ⟹ AI
* RE power integration into the power system ⟹ presence of other technologies
* Grid response to occur within seconds ⟹ Embedded AI will analyze and model these consumption data





Towards Demand-led Flexibility Society

Thanks for Attention

Continue relying on traditional centralized energy of the 20th century

OR

Begin to make the long term transition to the distributed energies of the 21st century

Corresponding authors:
liuchangliang.mcgili@gmail.com
marcotte.suzanne@uqam.ca

Industry 4.0 and IoT: enabling technologies and approach for fast and efficient door to door supply chain

Simone Siria, Log@Sea - Circle

Graz, 6 July, 2017

Circle
Touch your ideas

Agenda

Digital disruption and IoT scenario in the logistics industry

Circle IoT approach & solution

Circle successful IoT projects:

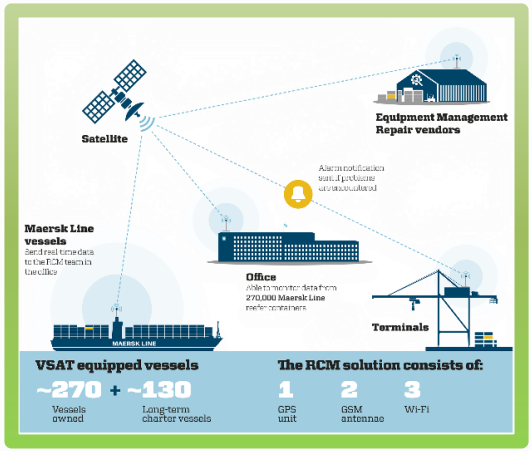
- **B2MOS – international Ro-Ro transport in import from Rades to Leghorn**
- **Italian Car Manufacturer Company – export flow from the production plant to ports of Civitavecchia and Salerno**

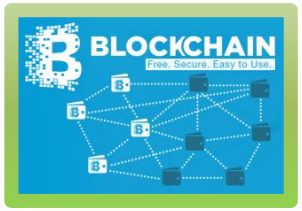
Circle
Touch your ideas

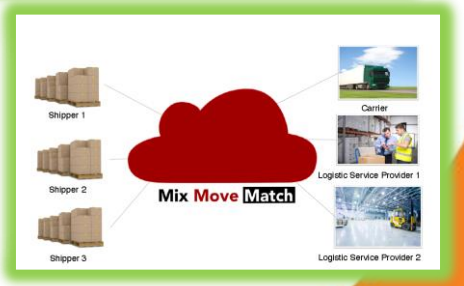
Digital disruption in logistics industry

Maersk's CEO has recently declared «we are ***embracing the age of digitalisation***… systems that offer the chance to **reduce costs by up to 30%** by **better coordinating** the interaction of ships and shore… collect more real time data.. Offer **new services**… **predictive** approach»

Several IT Platforms have been recently launched on the market with new business models and services. Nowadays, the most clear example of this process is the collaboration between **IBM** and **Maersk** with the **Blockchain Technology**. Other solutions are: INTTRA, GT Nexus, xChange, MixMoveMatch…







Also **Hapag Lloyd, MSC, CMA CGM** have announced similar investments on **Big Data and IoT solutions**. "**Digital Disruption is ongoing**".

Circle
Touch your ideas

Supply chain operators approach

To get aligned with **ever-changing logistics scenario**, the logistics operators along the supply chain need:

A clear vision of the entire supply chain in a Door To Door perspective – to have a complete picture up and down their supply chain at international level (MED area, etc.)

IOT opportunity exploitation – possibility to amplify the opportunities by implementing IoT solutions

Circle
Touch your ideas

Italian logistic scenario

Private sector: multinational companies, Port and Logistics Operators, etc.

Ports' congestion
Increasing risks of supply chain disruption

Loose of competitiveness

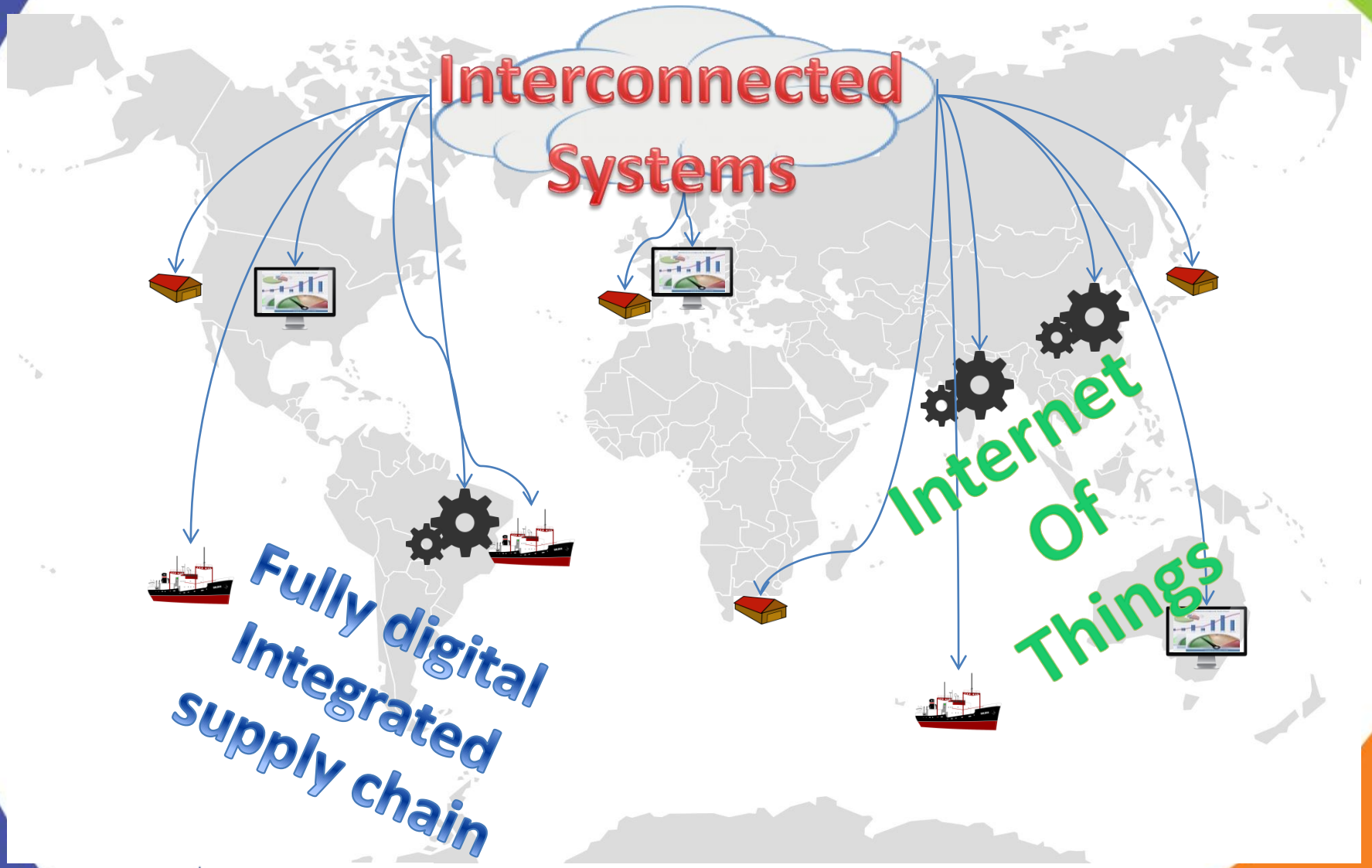
Public sector: Italian Customs Agency and other administrations

Increase visibility of goods and transactions

More effective controls

Circle
Touch your ideas

A shared vision with Italian Customs: Industry & Logistic 4.0



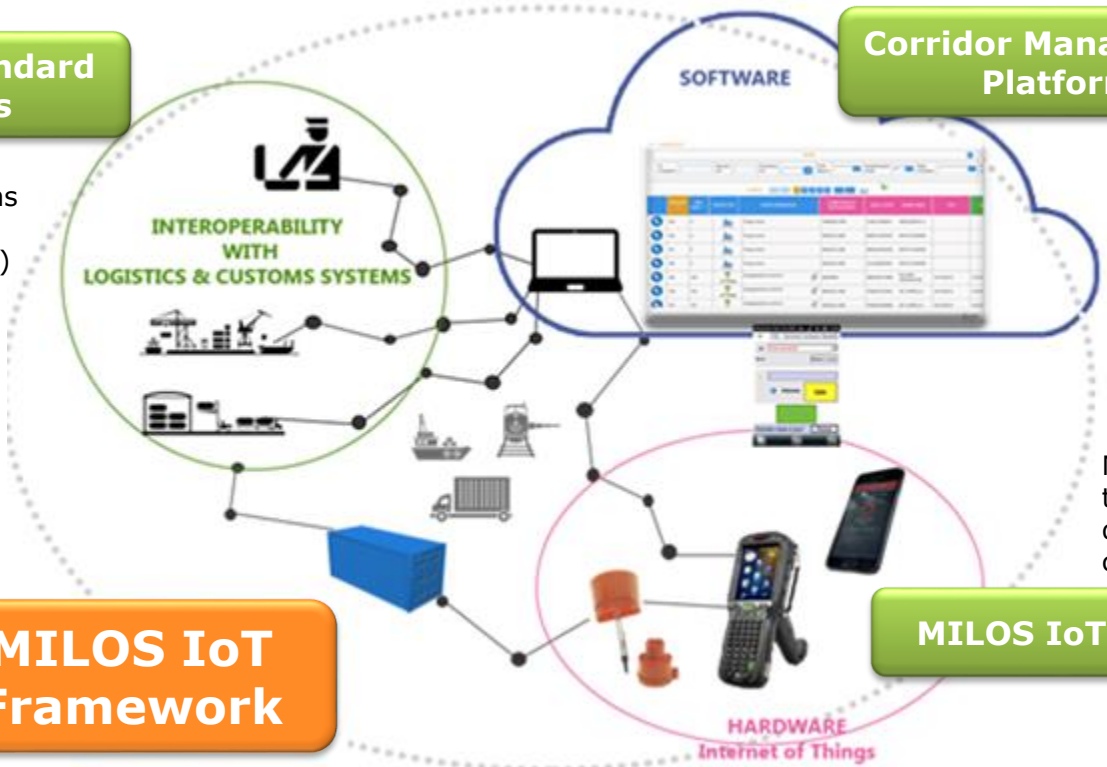
AGENZIA DELLE DOGANE E DEI MONOPOLI

MILOS IoT Solution

MILOS IoT allows authorized companies and authorities (shippers, port Authorities, logistics terminals, Customs Administrations, etc.) to access *status information* of monitored units (such as container, cars, trainers, etc.), matching *logistics data with security information*, supporting the related changes in business processes and the opportunities for process automation.

MILOS IoT Standard connectors

Standard connectors with external systems (Customs Administration, Port Community Systems, etc.)



Corridor Management Platform

Platform which integrates information retrieved by MILOS IoT Mobile and other external platforms

Mobile Software which allows to interoperate with all IoT devices (read and write infos, check security status, etc.)

MILOS IoT Mobile

MILOS IoT Framework

MILOS IoT has a special focus on the integration of GPS, *RFID active and passive* technologies (tags and eSeals) into the full logistic chain business processes.

Circle
Touch your ideas

Circle Successful IoT projects

B2MOS Project

RFID Passive eseal in a RO-RO transport from Rades (Tunisia) and Leghorn (Italy) with a Preclearing customs procedure

Italian Car Manufacturer Company Project

Tag RFID in a car transport from the production plant to ports of Civitavecchia and Salerno with the innovative “fast export procedure” - ongoing

Circle
Touch your ideas

B2MOS Project

The pilot involved an international ***RoRo trasport*** of trailers between the ports of Rades and Leghorn.
A ***preclearing procedure*** using passive ***eSeals*** and a ***Corridor Management Platform*** were tested for the first time, integrating logistics and Customs aspects.

Private actors involved:

- Port Terminals of Leghorn and Rades;
- Importers;
- Exporters;
- Shipping Company;
- Shipping Agency;
- Freight Forwarders.

Public Institution involved:

- Leghorn and Rades Port Authority;
- Italian Port Captaincy;
- Italian Customs Agency.

Circle
Touch your ideas

B2MOS Project: Operative flow

eSeal apposition

Association Truck plate & eSeal number

Customs Preclearing

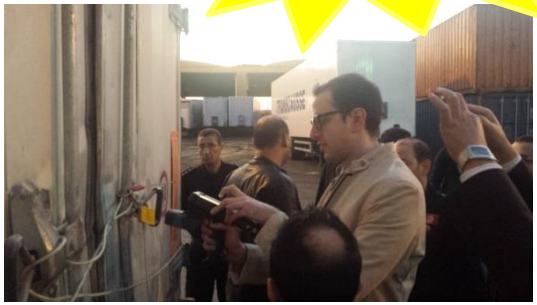
Interoperability Framework

AGENZIA DELLE DOGANE e MONOPOLI

Port Community System

Corridor Management Platform

Check of Customs status



Gate out or Customs Control

Circle
Touch your ideas

Italian Car Manufacturer Company

The project involved an international ***export transport*** of new vehicles between the production plant and the ports of Salerno and Civitavecchia, to the final destination.
A ***fast export procedure*** using passive ***RFID Tags*** and a ***Corridor Management Platform*** were implemented, integrating logistics and Customs aspects.

Private actors involved:

- Italian Car Manufacturer Company;
- Freight Forwarder;
- Circle;
- Grimaldi Lines;
- Grimaldi Terminal of Civitavecchia and Salerno;

Public Institution involved:

- Port Authority of Salerno;
- Port Authority of Civitavecchia;
- Italian Customs Agency.

Circle
Touch your ideas

Italian Car Manufacturer Company

Installing of RFID tags inside the production plant

Anticipation of export procedure

Transportation by truck or rail of new vehicles to the port of departure

AGENZIA DELLE DOGANE e MONOPOLI

Outcome of Customs status of goods

Loading of the transported units on the board of ship

Automatic Gate-in inside the port area thanks to RFID antennas

Circle
Touch your ideas

IoT application in logistics industry - Benefits

More **security and visibility of goods** for both private and public operators;

Reduced **transit time and dwell time** at the various checking points;

Possibility to **exploit the benefits of simplified Customs procedure**.

Circle
Touch your ideas

DROP US AN E-MAIL

siria@circletouch.eu

WEB-SITES

www.circletouch.eu

FOLLOW US ON LINKEDIN

https://www.linkedin.com/company/circle-srl?trk=biz-companies-cyf

Thank you

Circle
Touch your ideas