

**CLUSTER
FOR
LOGISTICS**

LUXEMBOURG
ADDING VALUE IS THE KEY.



Cluster for Logistics & LCL Conference

Digitalising logistics & supply chains to reinforce resilience

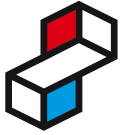


C4L Spring Conference
June 2022

Director Malik Zeniti
Cluster for Logistics Luxembourg

ADDING VALUE IS THE KEY.

SINCE 2009



Digitalising Conference

Agenda and Speakers

Part I:

14:00 – 14:10

Welcome and announcement of Five-year Anniversary of the LCL
by **Prof. Benny Mantin**, Director of the Luxembourg Centre for Logistics and Supply Chain Management (LCL) (including short Anniversary video)



14:10 – 14:20

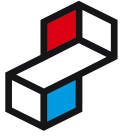
“Leveraging topographical data to reduce carbon emissions and fuel consumption in transport”
by **Mr Poulad Moradi Shahmansouri**, PhD Candidate at the Luxembourg Centre for Logistics and Supply Chain Management



14:20 – 14:40

“Leveraging the CAVE Lab for data-driven decision making in logistics and supply chain management”
by **Professor Pascal Wolff**, Professor at the MIT Global SCALE Network’s Ningbo China Institute for Supply Chain Innovation (NISCI) (online)





Digitalising Conference

Agenda and Speakers

14:35 – 14:45

“Procurement in uncertain times: challenges, and is going digital an opportunity, or threat?”

by **Mr Marcel Dinu**, Vice President, Vendor Management, Procurement and Supply Chain, SES Satellites, on their DP challenges



14:45 – 15:15

“On platforms and digitalization of transportation procurement”

by **Mr Christian Wilhelm**, CEO, and dialogue with LCL PhD candidate **Ms. You Wu**, on a project in collaboration with Shipsta



15:15 – 15:30

Keynote speech on “the Ups and Downs of Digital Transformation of Supply Chains”

by **Ms. Maria Jesus Saenz**, PhD, Executive Director, MIT SCM Masters Programs Director, MIT Digital Supply Chain Transformation (online)



15:30 – 16:00

Coffee break

CLUSTER FOR LOGISTICS



Digitalising Conference

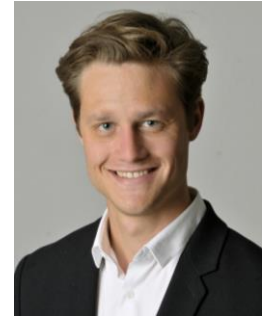
Agenda and Speakers

Part II:

16:00 – 16:10

Introduction and Presentation of the Survey Digital Transformation in Transport and Logistics

by **Mr Malik Zeniti** and **Mr Philippe Scholten**



16:10 – 16:30

The untapped value of innovation in Supply Chain 4.0

by **Mr Arnaud Lambert**, Director at Luxembourg Digital Innovation Hub



16:30 – 17:00

Practical Case: How digitalization can generate revenue using mobility devices: The LuxairCARGO case

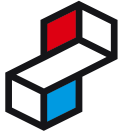
by **Mr Francois Dolisy**, Managing Director at 4i



Practical Case: New trends in InfoSec, Cybersecurity, and Supply Chain Attacks

by **Dr Carlo Harpes**, Managing Director at itrust





Digitalising Conference

Agenda and Speakers

17:00 – 17:25

Panel Discussion: The Ups and Downs of Digital Transformation of Supply Chains revisited moderated by **Prof. Benny Mantin**, Director of the LCL



Panellists:

Mr Arnaud Lambert, Director at Luxembourg Digital Innovation Hub
Mr Francois Dolisy, Managing Director at 4i
Mr Christian Wilhelm, CEO at Shipsta
Dr Carlo Harpes, Managing Director atitrust

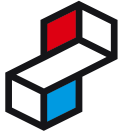


17:25 – 17:30

Closing Remarks by Prof. Benny Mantin, Director of the LCL

17:30 – 19:00

Networking Drink



Digitalising Conference

LCL Students Posters (selection)

Optimal Configuration Parameters for Last Mile Routing Solutions

Student: Kubra Bayik, LSCM 2022
 Advisor: Joachim ARTS
 Sponsor: Francisco VITI
 Sponsor Company Name: Urbify

Motivation / Background

Urbify is a dynamic logistics start-up based in Germany providing B2B software solutions to online retailers. It supports online retailers in the efficient and customer-oriented execution of last-mile deliveries. Urbify is now looking for making daily last-mile delivery operations more predictable for customers and more efficient for retailers.

Key Question / Hypothesis

What are optimal configuration parameters for a route optimizer to improve the efficiency of routes while maintaining high service reliability?

Relevant Literature

- Toth, Paolo & Vigo, Daniele. (2015). Vehicle Routing: Problems, Methods, and Applications, second edition. Philadelphia, PA: Society for Industrial and Applied Mathematics.
- Myers, Raymond H. & Montgomery, Douglas C. & Anderson-Cook Christine M. (2016). Response Surface Methodology: Process and Product Optimization Using Designed Experiments, 4th edition. Wiley.

Initial Results

Route Duration Times (Planned & Actual)

Actual routes are 43 mins behind the plan

Actual Delivery Time Deviation

Delivery Status Distribution

Expected Contribution

- Assessment of the impact of different configuration settings in the route optimizer on the efficiency and reliability of the planned tour.
- The results will yield more efficient and customer-oriented routes and find a balance between reliable communication with customers and achieving efficiency in the routing.

Kubra BAYIK

Integrated Sustainable Supply Chains

Student: Abhijit Surandasha, LSCM 2022
 Student: Ankit Nain, LSCM 2022
 Advisor: Dr. Laurens Deprez
 Sponsor: pwc

Background / Motivation

Procurement Management

- Strategy: Categories, Suppliers
- Maritime Linkage: 548 Ships | 90% Trade | 2.2% GHG
- Innovation Focus: Process, Technology, Skills
- Supplier Integration: Trust, Clarity, Partner
- ESG Goals: People, Planet, Profits

Key Questions

- What is the potential impact of procurement on achieving ESG goals and how can it be measured?
- With 90% global trade dominated by Maritime, how can it enhance ESG compliant sourcing?

Relevant Literature

- Global regulatory policies on ESG & Maritime
- Industry research reports, articles & reviews on trends and new developments in ESG, Procurement and Maritime

Integration with Maritime for Sustainable Sourcing

Initial Results

Procurement Planning

- Supplier Code
- Supplier Origin
- Supplier Mix & Selection
- Inventory Policy
- Capacities & Infrastructure

Procurement Operations

- Contract Management
- Mode of Transportation
- Order Quantity, Mix, Frequency
- Lead Times & Delays
- Changing Demand

Maritime Planning

- Routing & Scheduling
- Intermodal Network Design
- Fleet Deployment
- Tide Lagoon Concept
- Queueing Model for Ports

Maritime Operations

- Ship Size & Speed
- Port & Terminal Management
- Vessel Train Concept
- Blue Carbon Replenishment
- Optimal Use Model

Expected Contribution

- Identifying metrics to design a framework for measuring impact of procurement on ESG goals
- Highlighting benefits of integration with Maritime to build sustainable procurement
- Predicting impact on ESG goals of a chosen company to illustrate the proof-of-concept

Abhijit Surandasha, Ankit Nain

Analysis of pricing behavior in freight tendering processes

Student: Gihan Bulathsinhhalage, LSCM 2022
 Advisor: Benny Martin, You Yu
 Sponsor: SHIPSTA

Motivation / Background

Worldwide freight rates had risen seven-fold in 2021. Impacts of the container freight rate surge alone will increase consumer price levels by 10% for some commodities. UNCTAD Review of Maritime Transport (2021) 57 – 75 Pricing is a crucial factor in shippers buying decision in freight tendering processes

Key Question

What features characterise the pricing behavior in freight tendering processes?

Relevant Literature

- Estimating and benchmarking Less-than-Truckload market rates (2010) 667-682
- A re-examination of the cost structure for specialized motor carriers (1987) 339-351
- Modeling the Present Carrier Rate Structure as a Benchmark for Pricing in the New Competitive Environment (1981) 59-66

Freight tendering process map

TENDER PREPARATION

- Comprehension data
- Rate sheet
- Business requirement

TENDER PURCHASE

- Supplier Onboarding
- Request for quotation (RFQ)

TENDER ANALYSIS

- Analysis and Evaluation of bids
- Supplier ranking

ROUND MANAGEMENT

- Supplier Feedbacks based on analysis
- Second round bids

Initial Results

Per container freight rates

The graph demonstrates, reefer 40 ft container freight rates paid by a European pharmaceutical company in Rotterdam to Shanghai shipping line between 2020 - 2021.

The minimum and maximum rates show significant difference for some carriers. For this scenario the maximum freight rates on average is 60% expensive than the minimum rate paid.

Expected Contribution

- Characterise pricing behavior and define key features which impact freight rates
- Provide insights to shippers and carriers to see their current operations from a different perspective

Gihan Bulathsinhhalage
 gihan.bulathsinhhalage.001@student.uni.lu

Economic value prediction of multi-echelon safety stock optimization based on supply network features

Student: Harika Marisetti, LSCM 2022
 Student: Lakshmi Ravi, LSCM 2022
 Advisor: Joachim Arts
 Sponsor: BASF

Motivation / Background

8% of the asset value is stuck in inventory during the year 2020 as per the McKinsey global institute report on global balance sheet

Organizations are giving importance to inventory optimization

- Local optimization of inventory
- Advantages of global optimization & its value

Key Question / Hypothesis

What are the supply chain network features that impact the added value of the end-to-end safety stock optimization?

Relevant Literature

- Stephen C. Graves, Sean P. Williams. (2008) Optimizing Strategic Safety Stock Placement in Supply Chains. Manufacturing & Service Operations Management 2(1):68-83
- Thomas L. Magnanti, Zuo-Jun Max Shen, Jia Shu, David Simchi-Levi, Chung-Piaw Teo (2005). Inventory placement in acrylic supply chain networks. Elsevier, Operations research letters 34 (2006) 228-238

Initial Results

Total safety stock cost is calculated using concave piece-wise linear cost structure

Average Relative Improvement Potential for different Supply Chain network types

The Problem

End-to-end optimization involves

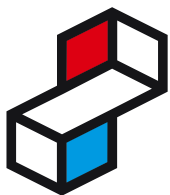
- Huge mathematical computation
- Co-ordination in multi echelon network
- High Investment & lack of clarity on value vs price for enabling management decision

Expected Contribution

Model that takes supply network features as inputs and predicts the value of safety stock optimization

Applicable to all networks irrespective of complexity

Harika Marisetti, Lakshmi Ravi



Introduction: Why is digital transformation necessary to be more resilient?

HOW LONG CAN YOU WORK ON MAKING A ROUTINE TASK MORE EFFICIENT BEFORE YOU'RE SPENDING MORE TIME THAN YOU SAVE?
(ACROSS FIVE YEARS)

HOW MUCH TIME YOU SHAVE OFF	HOW OFTEN YOU DO THE TASK					
	50/DAY	5/DAY	DAILY	WEEKLY	MONTHLY	YEARLY
1 SECOND	1 DAY	2 HOURS	30 MINUTES	4 MINUTES	1 MINUTE	5 SECONDS
5 SECONDS	5 DAYS	12 HOURS	2 HOURS	21 MINUTES	5 MINUTES	25 SECONDS
30 SECONDS	4 WEEKS	3 DAYS	12 HOURS	2 HOURS	30 MINUTES	2 MINUTES
1 MINUTE	8 WEEKS	6 DAYS	1 DAY	4 HOURS	1 HOUR	5 MINUTES
5 MINUTES	9 MONTHS	4 WEEKS	6 DAYS	21 HOURS	5 HOURS	25 MINUTES
30 MINUTES		6 MONTHS	5 WEEKS	5 DAYS	1 DAY	2 HOURS
1 HOUR		10 MONTHS	2 MONTHS	10 DAYS	2 DAYS	5 HOURS
6 HOURS				2 MONTHS	2 WEEKS	1 DAY
1 DAY					8 WEEKS	5 DAYS

Automation (Time saving?)

How much time can you invest On improving a regular task to make it more efficient?

✘ Example: If you perform a task **daily** and want to save one minute off, you can spend **up to one day** making improvements and in five years you'll break even.

✘ If you perform this task **five times a day**, it's worth spending **up to six days** to improve it by 1 minute.



Cluster for Logistics Luxembourg

Luxembourg's logistics cluster since 2009



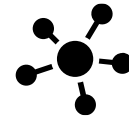
Cluster for Logistics Luxembourg

Federates public actors & private companies to drive the sector since 2009



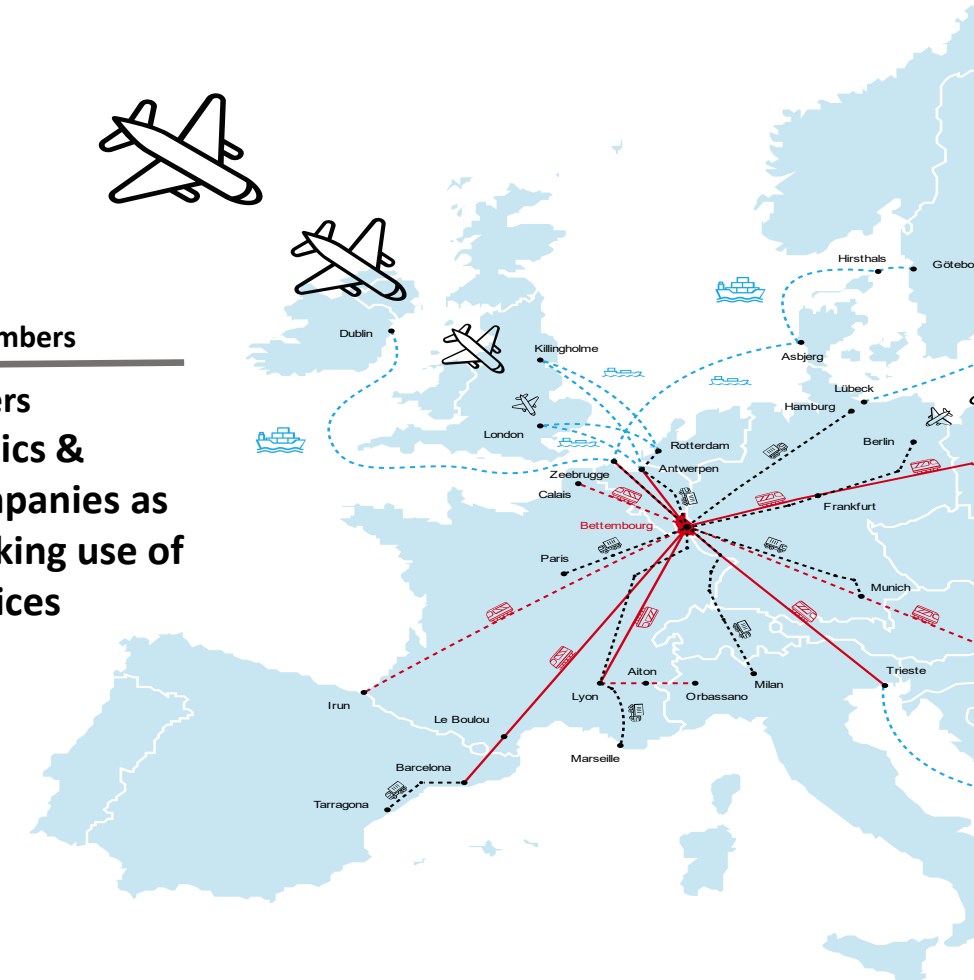
Mission

Support Luxembourg's **diversification** strategy by reinforcing logistics and global supply chain
Adding Value is Key



Network of Members

100+ members
focus on logistics & transportation companies as well as shippers making use of logistics services

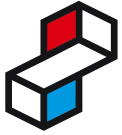


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ActivityReport
2021

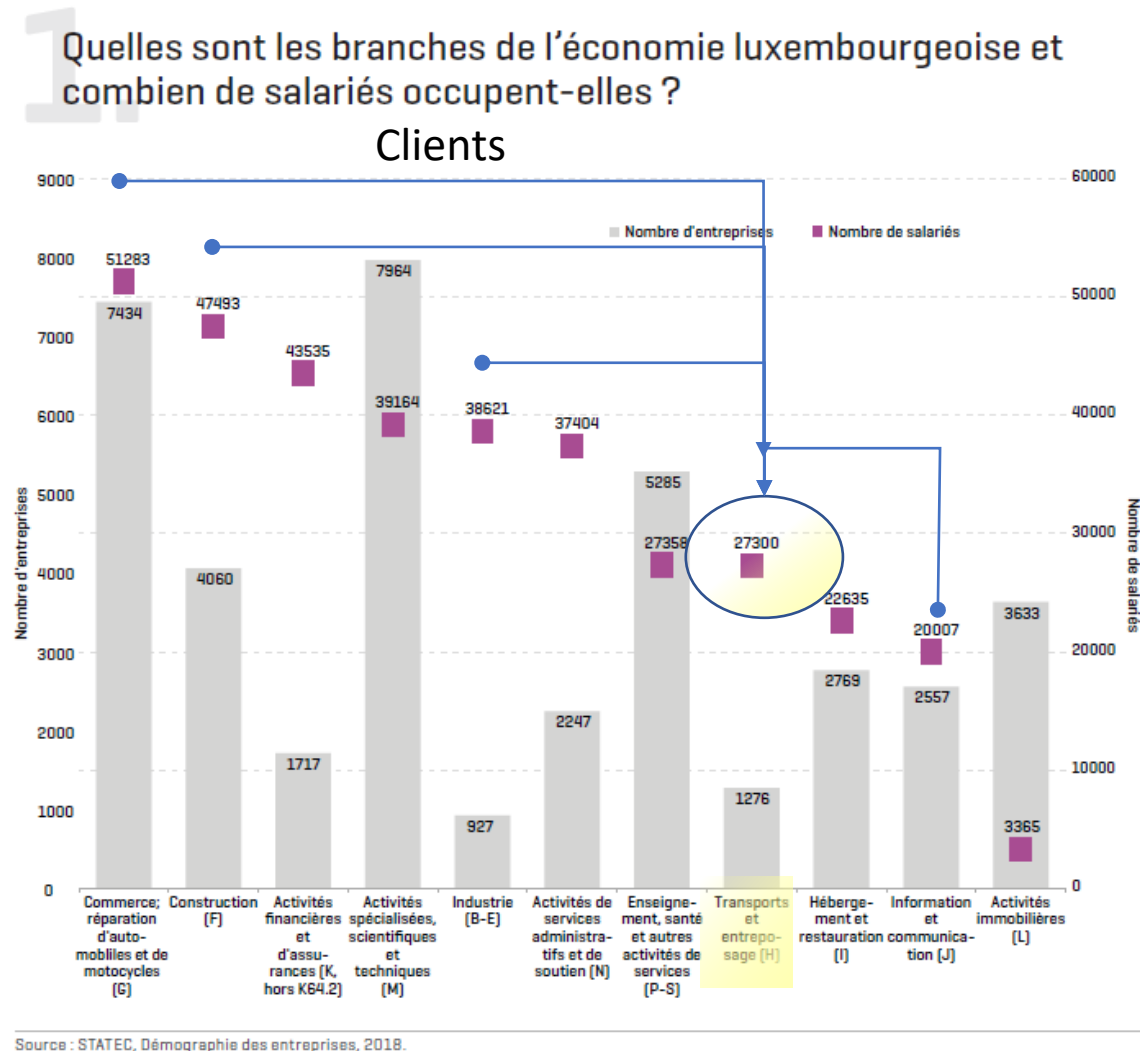


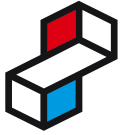
Activity Report 2021 www.c4l.lu/report2021



Logistics in Luxembourg

Facts & Figures on Workforce 2020





Cluster for Logistics Luxembourg

Mission: Innovation



INNOVATION

- Digitalisation and ICT
- Link to House of Start-ups and LCI
- Link to LIST and University LCL
- Sustainable Logistics (Lean + Green)
- Collaborative Projects

Cluster for Logistics Initiatives



Digital Working Group

A digital working group was hosted by the C4L in collaboration with various partners like the LIST, the LCL or members in order to advance the digitalization process in the logistics sector.

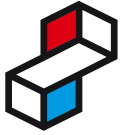
Cluster for Logistics Partnerships



Innovation Conferences

The C4L strives to organize regular conferences on current and innovative logistics topics. The focus here is on enabling experts to exchange ideas on specific topics and to implement them within their logistics companies.

Next Conference: **Digitalising logistics & supply chains**



Cluster for Logistics Luxembourg

Mission: Knowledge Sharing

KNOWLEDGE SHARING

- Training with House of Training
- Conferences with Themes
- Support Trade Facilitation - SWL
- Education and Training
- Logistics in Education



Cluster for Logistics Initiatives



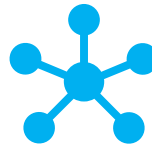
DT Logistics Program

2 High schools in Luxembourg:

- LTB
- LTL

Profile of a DT Logistician:

- Transportation Planning
- Warehouse Management
- Customs clearance



Young Logistics Professionals Networking

Joint initiative with LCL CML & C4L to foster networking & interaction between young logistics professionals and LCL students

Find more information here:

- [Young Professionals Luxembourg](#)
- [Cluster for Logistics](#)

Cluster for Logistics Partnerships



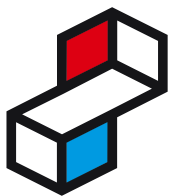
Master in Logistics and Supply Chain Management

The University of Luxembourg offers a **Master in Logistics & SCM** in collaboration with the MIT



eXplore Conference

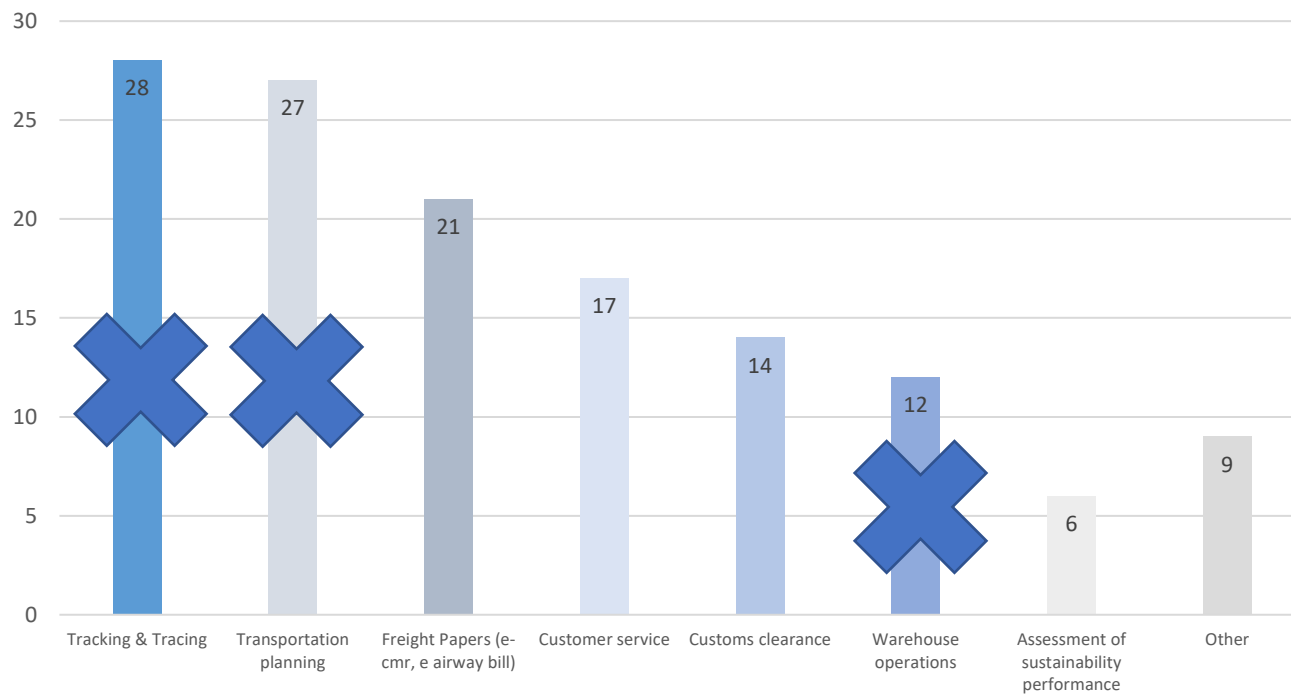
Yearly **eXplore conference** on new trends in logistics & supply chain and data-driven supply chains



Which subjects to address in our conference?

Survey performed in collaboration with Ministry of Economy: Details later

Which of the following do you consider as the main use case(s) for the digital transformation of your transport and logistics processes?

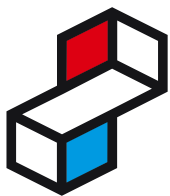


Learning from study

Use cases added
Cybersecurity, Procurement



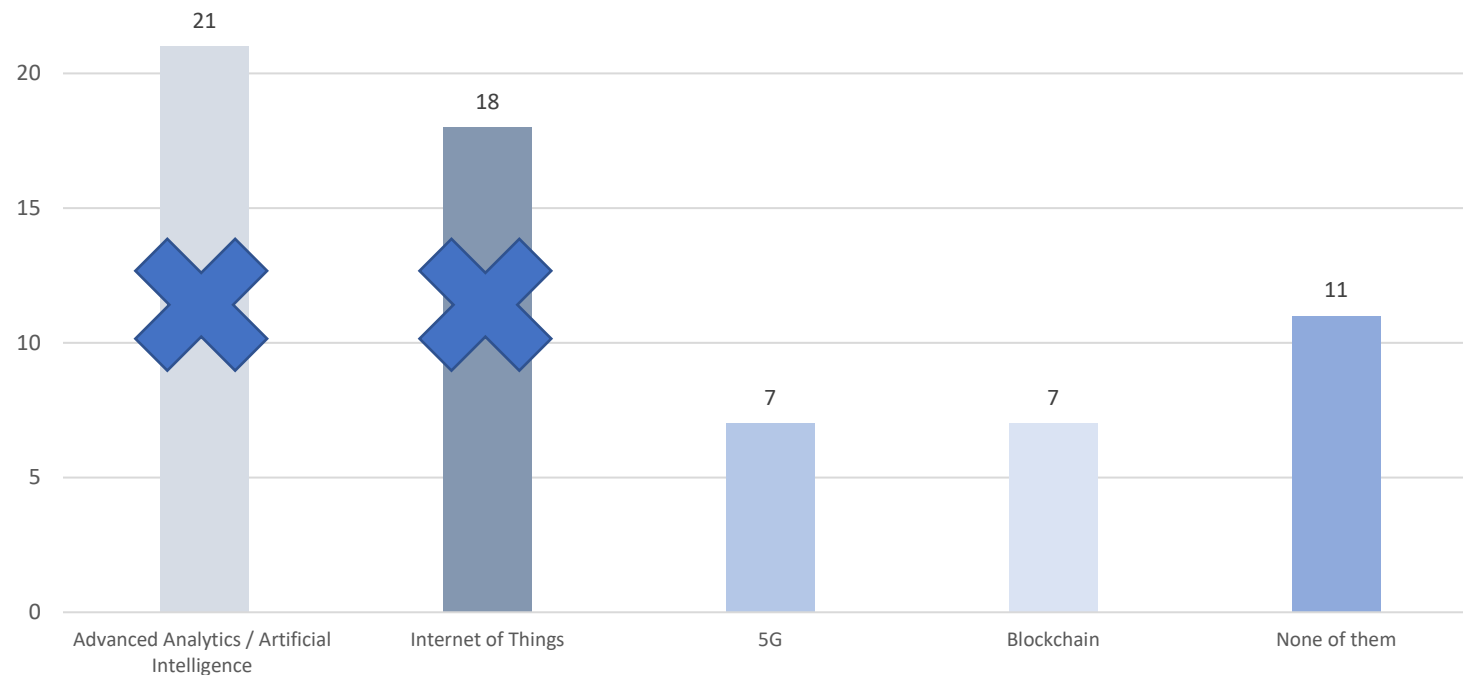
THE GOVERNMENT
OF THE GRAND DUCHY OF LUXEMBOURG
Ministry of the Economy



Which technologies to address?

Survey performed in collaboration with Ministry of Economy: Details later

Have you investigated one of the following technologies in the context of the digital transformation of your transport and logistics processes?



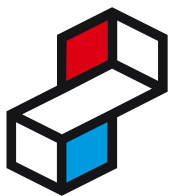
Learning from study:

Lagging technologies?
5G, Blockchain



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Ministry of the Economy

CLUSTER FOR LOGISTICS n = 39
Multiple answers were possible

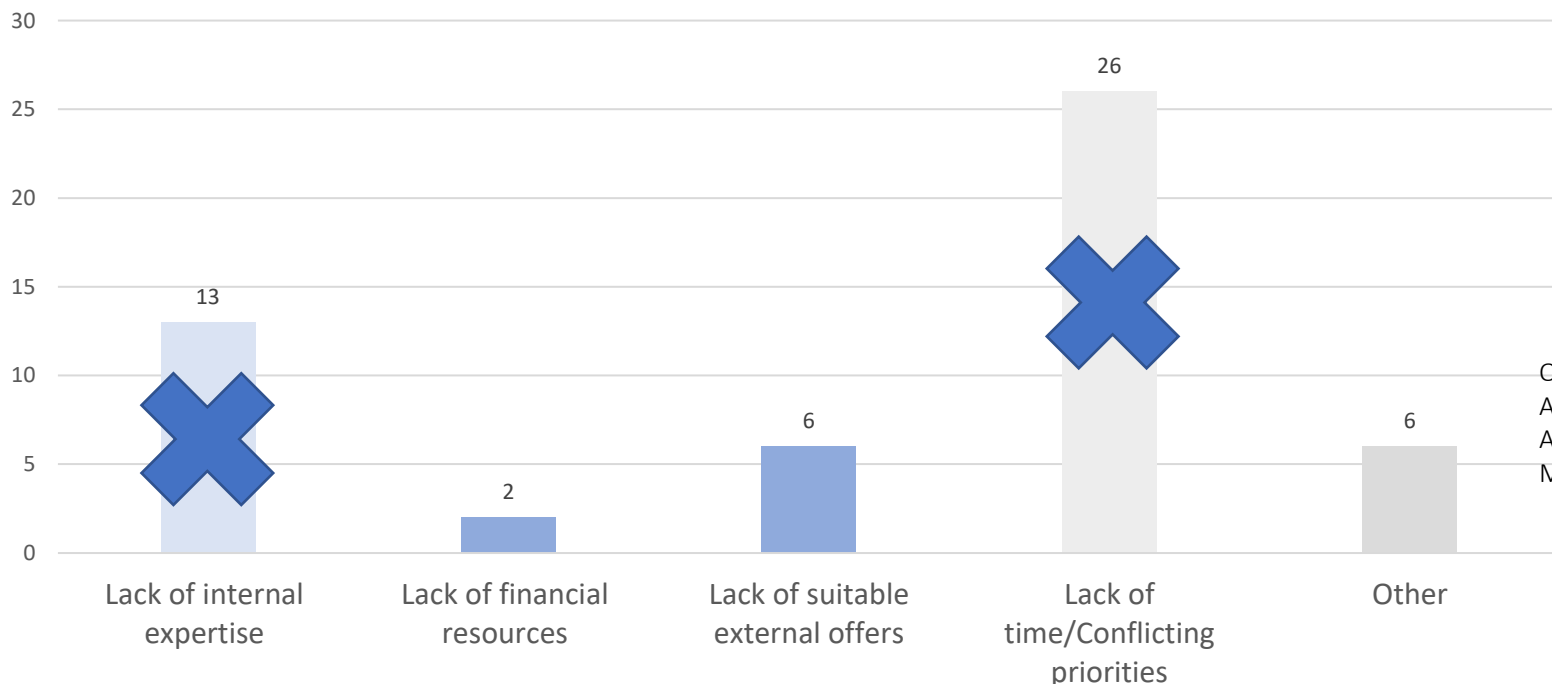


Barriers to digital transformation to address?

Survey performed in collaboration with Ministry of Economy: Details later



What is the main barrier for driving digital transformation processes in your company?



Learning from study:

Lack of talents and/or (internal) expertise?

Other: e.g., Lack of compliance, Acceptance of change management, Acceptance of employees, Complexity, Many involved stakeholders, etc.



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Ministry of the Economy



Status Logistics Hubs in Luxembourg

Eurohub Centre Logistics Parc



Video Link

www.c4l.lu/eurohub

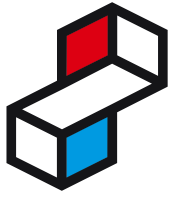


Status Logistics Hubs in Luxembourg

Eurohub Sud Bettembourg Dudelange Update June 2022

[Video Link](#)





Luxembourg Logistics

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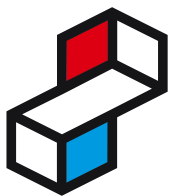
C4L Member Survey on Digital Transformation in Transport and Logistics

**C4L Spring Conference
June 2022**

Cluster for Logistics Luxembourg

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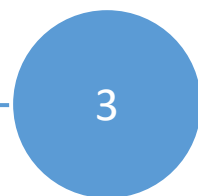
Agenda



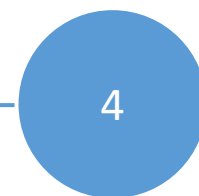
Key data
of the survey



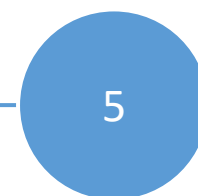
Internal implementation
of digitalization processes



Handling and
processing of data

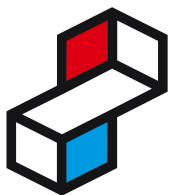


Excursus: Electronic
delivery notes



Key Results & Action
Points





1. Key data of the survey

Survey period | Company size | Company activities



Key data survey

Survey period:

01/02/2022 to 04/03/2022

Pool of participants:

Members of the C4L (n=92)

Participants:

39 Companies (n=39)



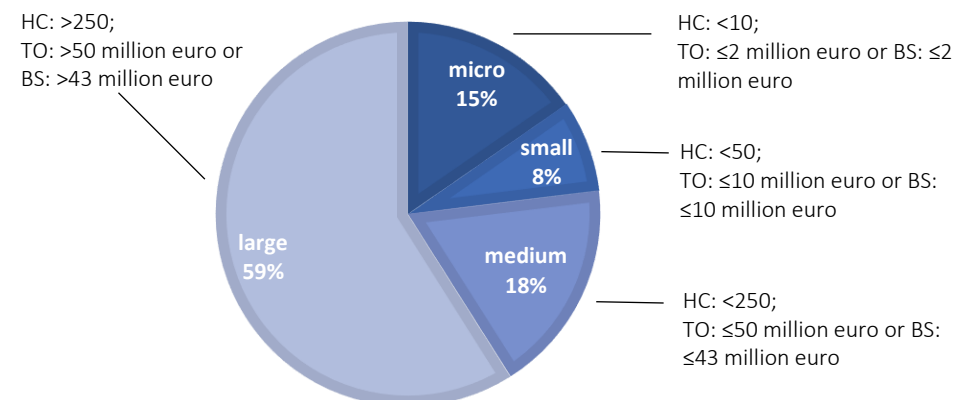
Key survey topics

1. Internal implementation of digitalization processes
2. Handling and processing of data
3. Excursus: Electronic delivery notes



Company size

Headcount and turnover or balance sheet

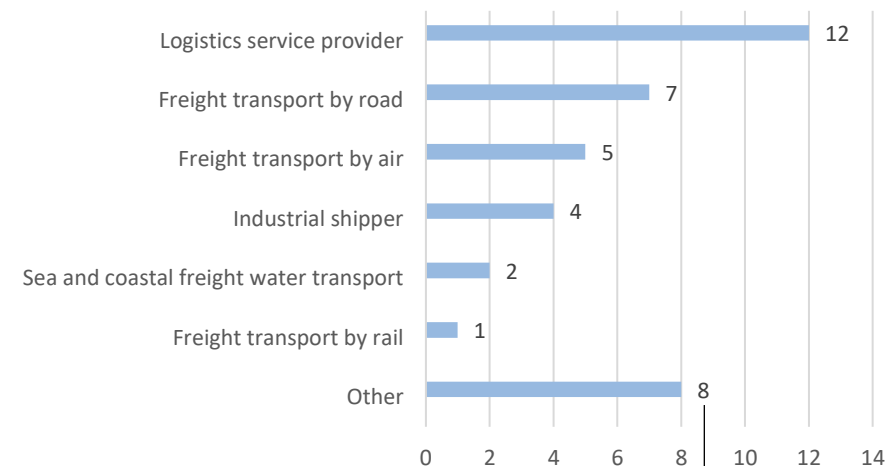


n = 39
HC: Headcount
TO: Turnover
BS: Balance sheet



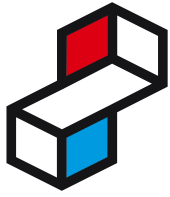
Company activities

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n = 39

Other: e.g., ground handler, warehouse construction, last mile, consultancy, platform provider, etc.



2. Internal implementation of digitalization processes

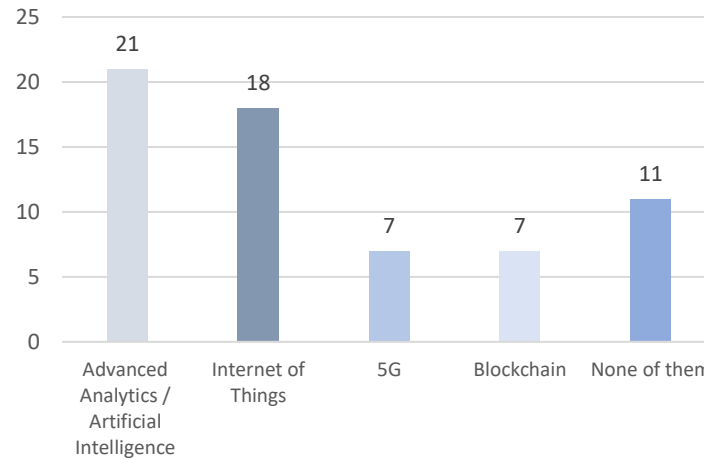
Main Use Cases | Investigated Technologies | Maturity of Projects

Which of the following do you consider as the main use case(s) for the digital transformation of your transport and logistics processes?



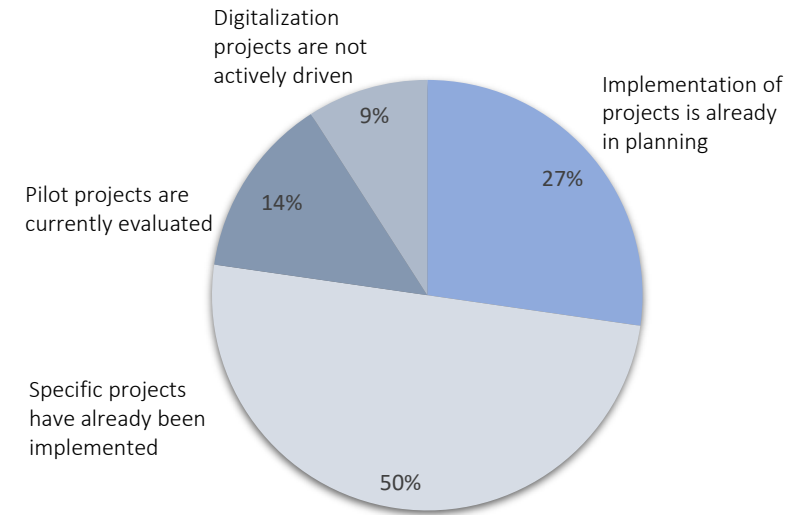
n = 39
Multiple answers were possible

Have you investigated one of the following technologies in the context of the digital transformation of your transport and logistics processes?

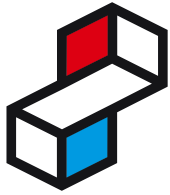


n = 39
Multiple answers were possible

How would you rate the maturity of your company's digitalization projects?



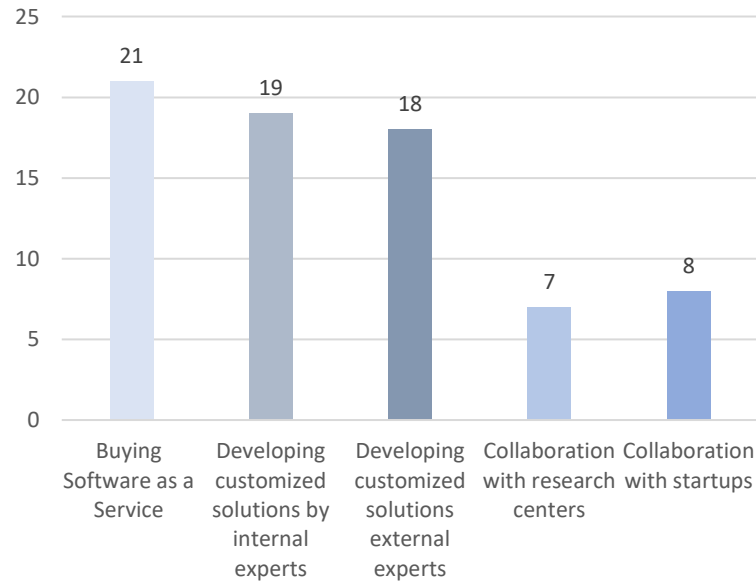
n = 39
Only a single answer was possible



2. Internal implementation of digitalization processes

Development of Projects | Barriers to Innovation | Skill & Talent Challenges

How does your company proceed to put digitalization projects into practice?



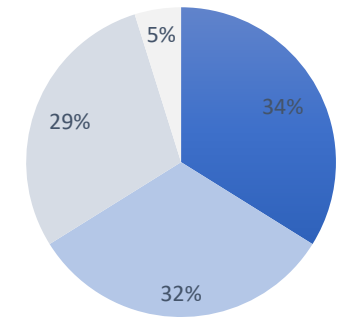
n = 39
Multiple answers were possible

What is the main barrier for driving digital transformation processes in your company?



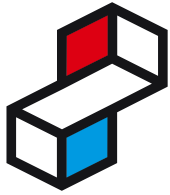
n = 39
Multiple answers were possible

What are in your view the main challenges with respect to skills/talents regarding the digital transformation of your company?



- Managing cultural change
- Recruiting people with the right skills
- Reskilling current workforce
- Other Other: e.g., Time & resources, Keep skilled employees with us

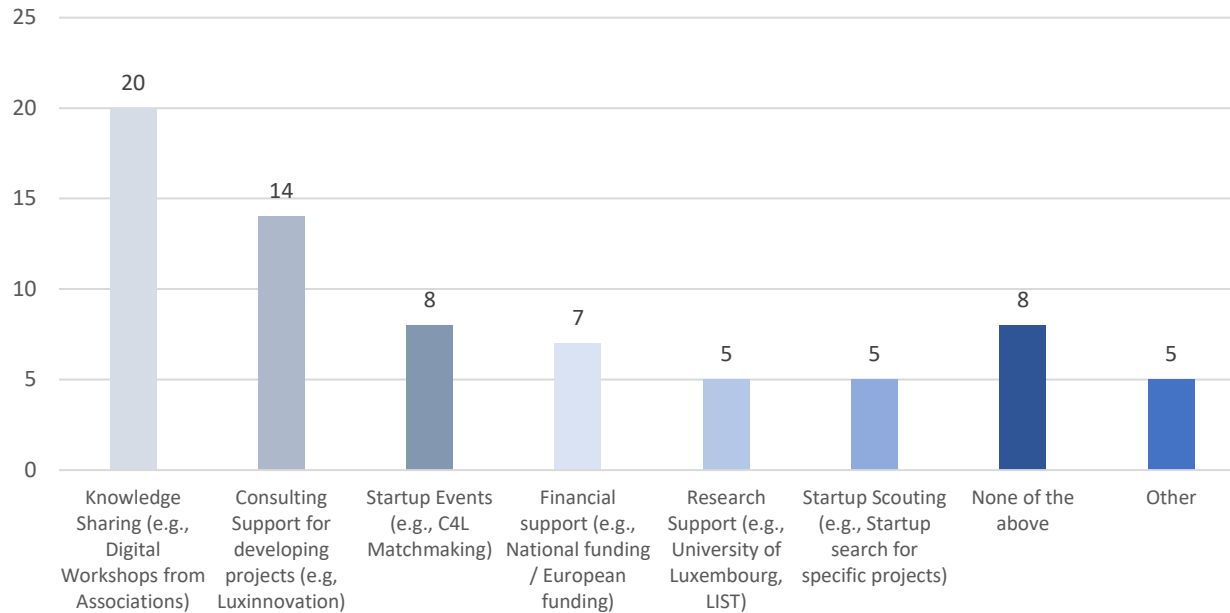
n = 39
Multiple answers were possible



2. Internal implementation of digitalization processes

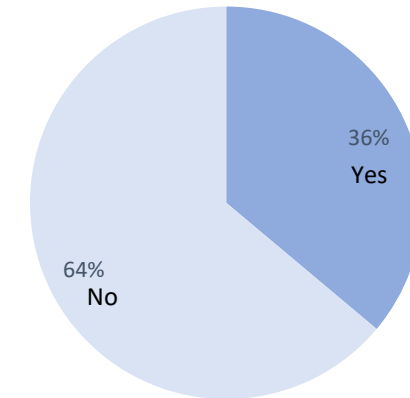
Support Initiatives | Percentage of Participation | Percentage of Participation

What kind of support would you need for moving forward in your digitalization efforts?



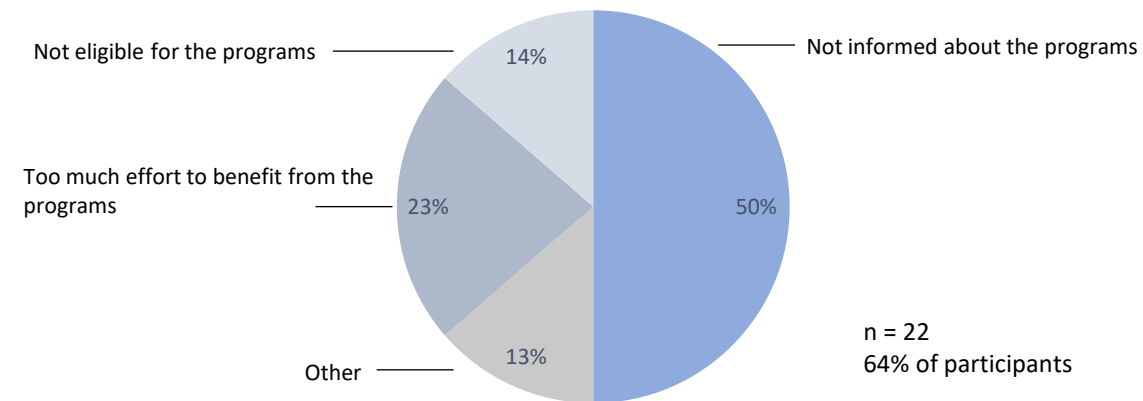
n = 39
Multiple answers were possible

Has your company already benefited from support initiatives offered in Luxembourg?

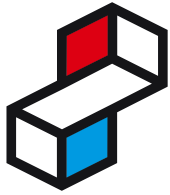


n = 36

If not, why has your company not benefited from such a support initiative(s) yet?



n = 22
64% of participants

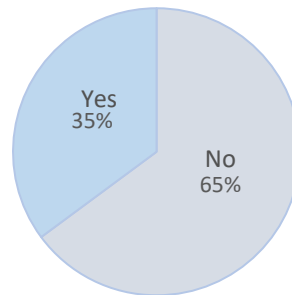


3. Handling and processing of data

Data Strategy | Sharing Data Key | Challenges of Data Collection

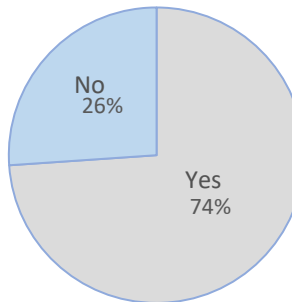
Does your company systematically collect and process data in order to evaluate and predict certain operational processes?

n = 37

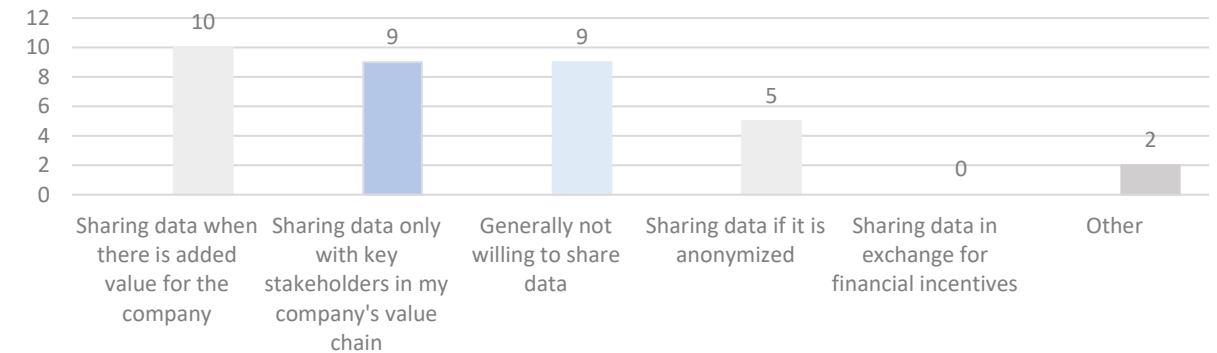


If so, has your company a defined data strategy to ensure the collection, use and governance of data?

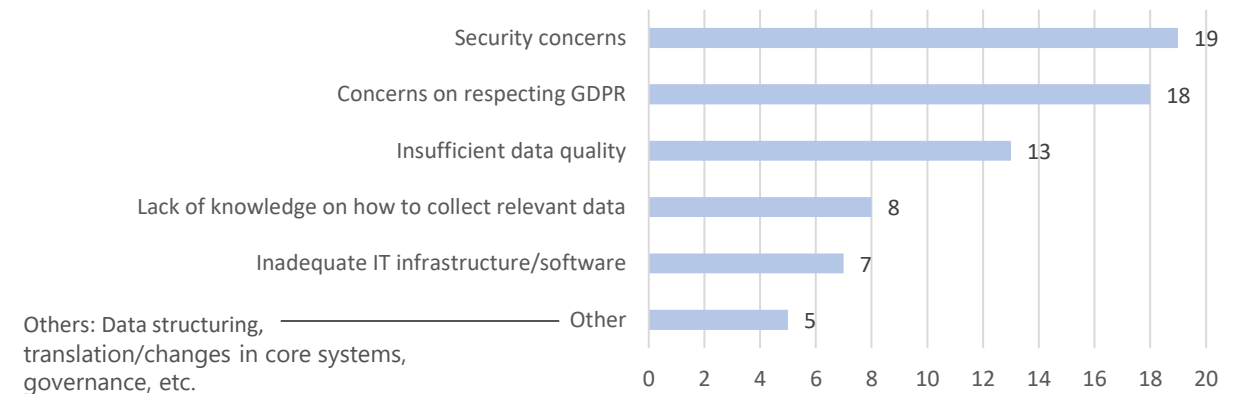
n = 23



How do you rate your company's willingness to share data?

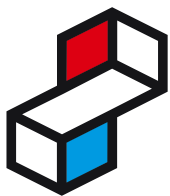


What do you see as the key challenges around data collection and processing?



n = 34

Multiple Answers were possible

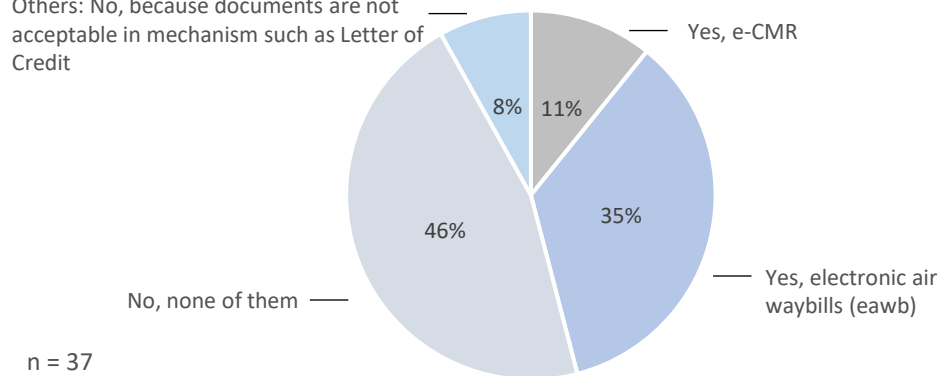


4. Excursus: Electronic delivery notes

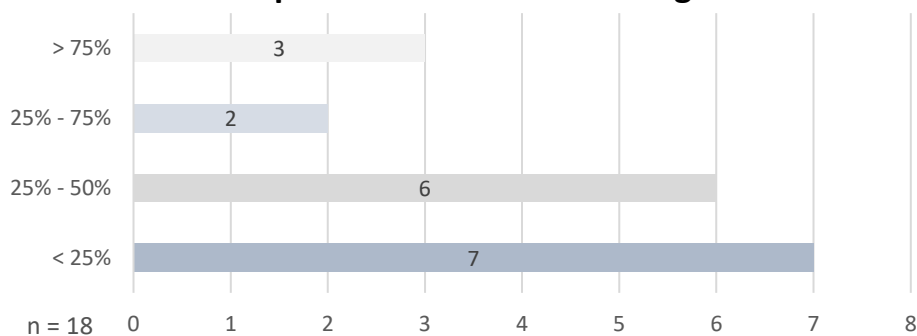
Usage of Electronic delivery notes

Does your company already work regularly with electronic delivery notes?

Others: No, because documents are not acceptable in mechanism such as Letter of Credit

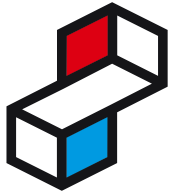


If so, how large is the share of electronic paperless freight documents compared to conventional freight documents?




If not, why are digital delivery notes not yet being used by your company?






5. Key Results & Actions from the Digital Transformation Survey

A = Action




91% actively drive digitalization projects

- 50%** have already implemented specific digitalization projects
- 27%** are planning the implementation
- 14%** are evaluating pilot projects



Main Use Cases

Operational Efficiency	Transportation Planning Processes (28) Digital Freight Documents (21) Warehouse operations (12)
Service Quality	Tracking & Tracing (27) Customer Service (17)



Main Technologies

AI	Advanced Analytics and Artificial Intelligence Solutions (21)
IoT	Internet of Things based Solutions (18)
None	Some companies seem to look at technologies they develop themselves (11)



Main barriers of driving digitalization projects

- 66%** Indicate having a lack of time or conflicting priorities A Action: Provide tailored support to our member companies regarding identified digitalization priorities to save the time of own research.
- 33%** Indicate having a lack of internal expertise A Action: Integration of digitalization expertise into school education DT Logistics, Bachelor in Logistics, etc.
- 1%** Indicate having a lack of financial expertise



Top priorities of support initiatives for C4L members

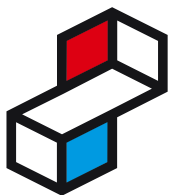
- 51%** Knowledge sharing organized by industry associations (e.g., Digital Workshops, Conferences, etc.) A Action: Organize digital workshops with experts on hot topics of digital transformation in logistics Knowledge sharing in our Podcast & Newsletter
- 36%** Consulting Support for developing digitalization projects (e.g., Luxinnovation)
- 21%** Startup Events (e.g., C4L Matchmaking Events) A Action: Maintain and extend startup matchmaking events to the needs of our members



64% have not benefited from support initiatives

- 50%** have not been informed about existing initiatives
- 23%** too much effort to benefit from initiatives
- A Action: Develop joint information campaigns about support initiatives in the ecosystem MECO, Luxinnovation, C4L, etc.

CLUSTER FOR LOGISTICS

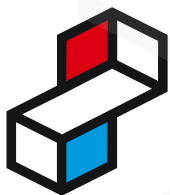


C4L Members and Partners

The frame contains the following logos and text:

- CHAMBER OF COMMERCE LUXEMBOURG** POWERING BUSINESS
- clc** commerce transport services
- Cluster Maritime** Luxembourgeois
- FEDIL** The Voice of Luxembourg's Industry
- LUXEMBOURG INSTITUTE OF SCIENCE AND TECHNOLOGY** | **LIST**
- LUXINNOVATION** TRUSTED PARTNER FOR BUSINESS
- uni.lu** UNIVERSITÉ DU LUXEMBOURG
- ARTHUR WELTER**
- ASTRON**
- cargolux**
- CFL multimodal**
- lux airport**
- CHAMP**
- DB SCHENKER**
- INL**
- Luxair CARGO**
- LUXPORT LORANG THESILUX** LUXPORT GROUP
- Post LUXEMBOURG**
- SOURCIFY**
- TRANSALLIANCE**
- enovos**
- SINGLE WINDOW FOR LOGISTICS LUXEMBOURG**
- LE GOUVERNEMENT DU GRAND-DUCHÉ DE LUXEMBOURG** Ministère de l'Éducation nationale, de l'Enfance et de la Jeunesse
- THE GOVERNMENT OF THE GRAND DUCHY OF LUXEMBOURG** Ministry of the Economy
- LE GOUVERNEMENT DU GRAND-DUCHÉ DE LUXEMBOURG** Ministère de la Mobilité et des Travaux publics, Département de la mobilité et des transports

CLUSTER FOR LOGISTICS



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