



The **Smart**  
**Logistics**  
Challenge

# The Smart Logistics Challenge

## How to Deliver, Tomorrow

**BALYO**



**SSI SCHÄFER**

**stow** MEMBER OF  
AVERY'S GROUP

**TOYOTA**  
MATERIAL HANDLING

**VANDERLANDE**

Competition organised by FEM



# How We Deliver, Tomorrow

The Smart Logistics Challenge' is an initiative designed to connect with university students by giving them the chance to put forward their ideas on the most exciting trends transforming the industry.

Moving goods is now faster than ever thanks to advancements in automation and technology. In an increasingly connected world, the materials handling industry is a silent hero. It provides the equipment and systems that enable the timely and precise delivery of all the things we couldn't live without. Tomorrow brings even more change: technological evolutions, consumer needs and sustainable development requirements mean the only way forward is innovation.

We have challenged European students in business and engineering to re-think how companies can best make use of Logistics 4.0 to meet future demands and help us achieve our goal as a sector to 'deliver tomorrow'.

In the following pages you will learn more about this competition and the six ideas that have the potential to revolutionise our industry.

*"We believe it is our duty as an industry association to make sure that young people know about the exciting opportunities on offer in the world of materials handling. Since we are not a consumer industry, it is harder to reach out to people outside our area of activity. This is why I have made it my priority as the FEM President to engage with the general public. And what better way to start than with a challenging competition for students – the future of everything we do?"*

Christophe Lautray  
FEM President

# The Challenge

The Smart Logistics Challenge asked students for a forward-looking and solution-oriented approach to tackle one of three case studies below.



## Enablers of e-commerce

**Reshape the supply chain to accommodate customer needs**

In Europe alone, around 25 million packages are delivered every day. Customers are buying online at an exponential rate with no sign of slowing down even in the next decade. How will companies be racing for e-commerce fulfilment in 2027?

The task was to propose innovative solutions in logistics environments to address the needs of e-commerce customers. You may propose technological and/or business solutions.



## Cobotics in Logistics 4.0

**When people and robots work together**

Cobots are supposed to be the new tools of the future. Working together with operators, they are meant to make logistics better, faster and more efficient. What happens in the warehouse when humans and machines collaborate and how will this revolutionise the industry?

The task was to imagine future cobotic systems that positively impact one or more aspects of logistics and equipment handling.



## Logistics in a Sharing Economy

**Opportunities to share tasks, jobs or equipment**

Many industries have been disrupted by the Sharing Economy and logistics is no different. What do you think this means for the materials handling sector and how will the industry be transformed?

The task was to imagine how sharing economy principles can be applied to develop new business models, new value streams and partner models in logistics.



# The Prizes

## The winners

The top six contestants with the best concepts win:

- A six-month paid traineeship with one of the partner companies
- A VIP Invitation to the FEM Congress 2018 in Antwerp, Belgium with all expenses paid, an exclusive tour of Antwerp and an industrial site visit

## TrendSpotter Award

The finalist with the most online votes during the period 30 July - 10 September 2018 will receive a special TrendSpotter Award.

## The FEM Congress Award

After the finalists' pitch during the Award Ceremony at the FEM Congress, the audience will vote for their favourite concept and presentation. The winner will receive a special FEM Congress Award.

## The FEM Jury Award

The finalist with the best scores from the jury of the competition will receive the grand prize of The Smart Logistics Challenge. This will take into consideration the innovation, relevance, feasibility and implementation of the concepts.

# The Partners

FEM is proud to be representing a diverse industry with creative and dynamic companies of all sizes. The six partners companies of The Smart Logistics Challenge share a common vision for FEM industries - an innovative industry that provides technological solutions to some of society's biggest challenges.



Founded in 2005, Balyo designs, develops and markets totally innovative handling robots. Thanks to its navigation technology, unique inside buildings, Balyo transforms standard forklift trucks into standalone intelligent robots, capable of working alongside human operators. The technological breakthrough introduced by Balyo has permitted fleets of robots to navigate in warehouses or in factories



Linde Material Handling GmbH, a KION Group company, is a leading global manufacturer of forklift trucks and warehouse trucks, and a solutions and service provider for intralogistics. With a sales and service network that spans more than 100 countries, the company is represented in all major regions around the world.



The SSI Schaefer Group is the world's leading provider of modular warehousing and logistics solutions. It employs some 10,500 people at its group headquarters in Neunkirchen (Germany), at more than ten domestic and international production sites, and at approximately 70 worldwide operative subsidiaries. Across six continents, SSI Schaefer develops and implements innovative industry-specific answers to its customers' unique challenges. As a result, it plays a key role in shaping the future of intralogistics.



Their journey started 40 years ago and today Stow International, part of the Averys Group, is one of the world's biggest players in storage solutions. They engineer, manufacture and sell top-quality racking systems for the storage of palletised or small goods and longer items, as well as mezzanine structures, compliant with the most stringent regulations.

**TOYOTA**

MATERIAL HANDLING

Toyota Material Handling Europe is part of Toyota Industries Corporation – the global leader in material handling, providing businesses of all sizes with a full range of material handling solutions. Toyota offers counterbalanced and warehouse trucks, semi & fully automated solutions, energy solutions, fleet management and services all designed to maximise safety, productivity and efficiency in your operations.

**VANDERLANDE**

Vanderlande is the global market leader for value-added logistic process automation at airports, and in the parcel market. The company is also a leading supplier of process automation solutions for warehouses. Vanderlande's baggage handling systems move 3.7 billion pieces of luggage around the world per year, in other words 10.1 million per day. Its systems are active in 600 airports including 13 of the world's top 20. More than 39 million parcels are sorted by its systems every day.

# The Process

6 APR	Competition deadline
29 MAY	Finalists designated
29 JUN	Finalists deadline
30 JUL	Winners announced
30 JUL	Public voting opens
10 SEP	Public voting closes
14 SEP	Award Ceremony

Following the competition launch on 15 December 2017, entries were accepted until 6 April 2018. The best submissions from this round qualified for mentoring from industry experts in order to move their concepts to completion. Finally, the jury selected six winners on 30 July.

The jury included some of the top leaders of the logistics and materials handling industry, comprising of one representative each from Balyo, Linde Material Handling, SSI Schaefer Group, Stow, Toyota Material Handling and Vanderlande, plus a representative from FEM.

The competition attracted 571 students across the fields of engineering, business, IT and social sciences from 26 countries.

*"Mentorship is all about guiding the students, and it amazes me how much more they inspired me than expected."*

*Axel Wahle,  
Marketing Director, Toyota Materials Handling  
Europe*

*"It is nice to see that the workforce of tomorrow is ready to tackle the current challenges of the market."*

*Rob Schmit,  
EVP Technology & Innovation, SSI SCHÄFER*

# The Winners



Enablers of e-commerce

## E-Truck Net

Student: Ángel Lorente, Universidad Politécnica de Valencia, Spain

The truck industry is very important in e-commerce nowadays and it will also be in the future. But today's logistics have several efficiency issues that affect its sustainability. Even though there are technologies under development that will contribute to faster and low-cost deliveries, it does not automatically imply that the current inefficient use of truck transportation is solved. Therefore, I introduce the E-Truck network: a solution that uses the technological developments of today to create a more efficient, low-cost and reliable truck transportation network.

My idea is to create a new company that will offer software solutions for efficient truck distribution over Europe. This company will offer services in managing floats of self-driving long distance trucks in the most efficient way and solving the problems of today's logistics to shipping companies that use self-driving technology.



Ángel Lorente

*"I decided to apply for this competition because I saw an opportunity for improving my creativity and learning how to develop an idea and turn it into a real project. I had a great experience during the competition. I learnt more than I could imagine at first. My mentor taught me how to take the important points of my idea and present them in a clear and convincing manner. I felt very pleased when I found out I was one of the winners. This is a great opportunity to experiment how it is to be in a top leading company."*





## Cobotics in Logistics 4.0

### Cobotic Systems: Reducing the Amount of Repetitive Work

Student: Mads Madsen, Technical University of Denmark

This solution is reducing the amount of repetitive work within picking from an Automated Storage and Retrieval System and increasing throughput. The cobots are working side by side with a human. Before the totes arrive at the picking station the content is scanned and processed using machine-learning to decide if the robot will be able to grab the products. At the picking station the cobots are equipped with 3D scan hard - and software to be able to grab the high variety of products. If the cobot cannot grab the products, depending on the type of error, the human either handles the product or teaches the cobot how to handle the product. In this setup the human is a coworker, a supervisor and a programmer. The cobots are movable and can be moved to other tasks.



Mads Madsen

*"I like that the competition has been on a conceptual level and that I had the freedom to choose myself a setting for the concept. Furthermore, I enjoyed the mentoring as the feedback and motivation from an industry expert made me think about other perspectives. Winning the competition was absolutely fantastic as in parallel I worked on my thesis and had to put in the extra hours in the evenings. I am looking forward to the trip to Antwerp to meet new exciting people and hear about the other concepts."*



## Cobotics in Logistics 4.0

### Unfilming of Pallets

Students: Dimitri Mathon and Charles Elloy, Ecole Catholique d' Arts et Métiers, France

Every day, a huge amount of pallets are manipulated all over the world whatever the business sector (600 million per year in France). To ensure a good preservation of products, a plastic film is applied all around the pallet. The addition of this film causes some secondary actions like filming and unfilming. These are low value-added tasks, repetitive and unpleasant for operators. That's why most of the filming is done automatically by a machine. Unfortunately no solution exists today for unfilming.

We decided to program the cobot to make it unfilm pallets. This operation will tend to reduce the time of unfilming, delete this physical task for humans by decreasing the number of musculo-skeletal disorders and improve the global performance of the company. Eventually using cobots is better than using robots due to their flexibility which allows the operators to move the cobot from one place to another to unfilm pallets.



Dimitri Mathon



Charles Elloy

*"We decided to participate in the contest because it dealt with a theme related to our research project of last year: "collaborative robots in the industry". What we liked most about the competition is the fact that innovation is put forward. When we learned we had won, we were astonished at the sight of the number of files submitted and then very satisfied and honoured by this recognition."*



## Logistics in a Sharing Economy

### How a Digital Network Can Increase The Scope of Opportunities in the Business World

Student: Diogo Cunha, Universidade do Porto, Portugal

Most companies waste potential by possessing unoccupied space for storage, inactive transportation vehicles or even unused goods. Therefore, I propose to create a digital network, strongly based on the Shared Economy principles, that connects companies by matching their needs, and that channels this wasted potential. This application receives inputs from the companies involved and, after an analysis, allows companies to get together and establish a win-win deal. Because securing data is crucial, data encryption measures to secure data analysis and selective data revelation are priorities to be considered. As the number of companies involved in the network increases, so does the number of opportunities and what was wasted potential can now be transformed into growth.



Diogo Cunha

*"It started as a captivating challenge which developed into a life-changing experience. Above all, I appreciated the feeling of contributing to something meaningful and the overall receptiveness to new ideas, especially in the mentorship phase. Indeed, being able to establish this kind of contact is just outstanding."*



## Logistics in a Sharing Economy

### Shared 3D Printing For The Maritime Logistics Industry

Students: Marcell Bozsik, Adam Geiszt, Erasmus Universiteit Rotterdam, Netherlands

In an industry where downtimes are extremely expensive and the uncertain availability of spare parts makes their resolution largely unpredictable and costly, 3D printing is knocking on the door to provide a faster, better, and economically more viable solution. However, due to the knowledge gap between demand and supply, there is nobody to open the door to the benefits of this new technology. To tackle this issue, we propose a platform-based aggregation of potential supply into a global, quality-validated network, and adding the sufficient maritime knowledge to it to enable the industry to cut repair lead times and thus save tremendous costs of downtimes.



Marcell Bozsik



Adam Geiszt

*"Marcell found the challenge somewhere, as usual, and after a bit of brainstorming, we concluded that it could be something really interesting to partake in. Later it turned out that it really was! We had a long journey to come but the amazing mentoring kept us going all the way. Whenever we were about to lose faith in what we were doing, this encouragement always got us back on track."*



## Logistics in a Sharing Economy

### The Smart Logistic Mutualisation Reversed Auctions Platform (SLM-RAP)

Student: Sophia Arfaoui, ISTEK - Ecole Supérieure de Commerce et Marketing, France

What if you could overcome the shortcomings of expertise during your calls for tenders and the writing of the specifications via the knowledge of similar project and return on experience? What if you could get suppliers or even a peer company to assist you in your need of understanding and defining your needs without fear of overconsumption or having a specification with gaps that would cost you up to 2 times the initial budget you had, plus the additional service thereafter? What if you could reduce your costs in the same way? What if you could improve your business with a partner close geographically? What if you could benefit from the same opportunity? What if you would like to rent equipment and empty space in a warehouse without having the need to rent the whole warehouse? That's what SLM-RAP will answer.



Sophia Arfaoui

*"I decided to apply because it was a great opportunity to combine what I learnt through my studies with pragmatic Industrial problematic. The main strength of that challenge was to be able to ally technicality and creativity, and be completely free to propose any kind of solution. This is a great opportunity to gain confidence in one's professional capacity to pilot a project end-to-end. THIS Challenge IS a REAL opportunity, as a future or young graduate, to prove what we are able to do and enter the professional world with a great line in our resume."*



# Considerations

The Smart Logistics Challenge is the first initiative of this kind led by an European industry association. Although companies normally compete to search for talents, we understood the value of joining forces and working together to achieve common objectives such as: emphasising the role materials handling industry has to play in this increasingly connected world, making sure young people are aware of the opportunities our industry has to offer, finding new and creative ways to look at the trends transforming society and our industry.

*"The logistics sector needs young, creative minds who recognise the potential of digitisation, automation and networking and develop ideas for innovative solutions and business models. Therefore, we are delighted with the large number of participants. This shows that our efforts are bearing fruit and that students from all over Europe see the material handling sector as an attractive field of work with exciting topics and personal opportunities," summarises Christophe Lautray, FEM President.*

*"This competition marks an important new role for European trade associations: moving beyond legislative and technical issues affecting the member companies towards addressing societal challenges affecting the industry as a whole. No company by itself will manage to change such trends, therefore industry cooperation is essential. "*

Olivier Janin  
FEM Secretary General



### **FEM - The European Materials Handling Industry**

Established in 1953 and based in Brussels, FEM is the European federation representing manufacturers of materials handling, lifting and storage equipment. Through its national member associations, FEM speaks for some 1,000 companies that employ around 160,000 people and generate around €50bn in annual turnover.

[www.fem-eur.com](http://www.fem-eur.com)

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