



Supply chains

Data, learning and artificial intelligence



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FOTO Lynette Haksel

Let's get English

September, the first month of a new academic year. Hopefully this time an academic year where students come back to campus, where The Villa will reopen and where interviews for the SCOPE can be done at companies instead of online.

After reading the first paragraph, you are probably thinking: 'Why is the preface English?' Well, each year, more and more international students start the bachelor Industrial Engineering. This leads to more internationals getting involved with Industria. So it is time to switch to an English association. Therefore, the SCOPE will be written in English from now on.

This edition, SCOPE collaborated with the European Supply Chain Forum to come up with relevant and interesting topics. During the summer holiday our editors worked hard to write the articles. In this edition I tell about ESCF and the roll of Artificial Intelligence within Supply Chains. Niek de Jong speaks about how AI changes markets. Vita Broeken talked with Vekoma and Heineken to give insights in their supply chains and how they make them more safe and sustainable. Robert Geurten tells about the coordinating role of a branch organisation in the return chain of empty beer bottles. Caitlin Riesewijk spoke with ASML about the impact of COVID-19 on their supply chain and Joost van der Haar tells about Supply Chain Mining.

Moreover, in this edition Nynke Theunissen reveals the theme of the 38th congress and the 58th board introduces herself. The Alumnia update, Alumnia speaking and the columns can be found on the last pages.

Then there is nothing left for me to do than thank you. Last year it was my pleasure to be the chief editor of the SCOPE but it is time for me to pass the baton to my successor Caitlin Riesewijk. Thank you for reading the SCOPE last year and hopefully you will enjoy my last edition.

Stefano Dimastrapasqua

Chief editor SCOPE



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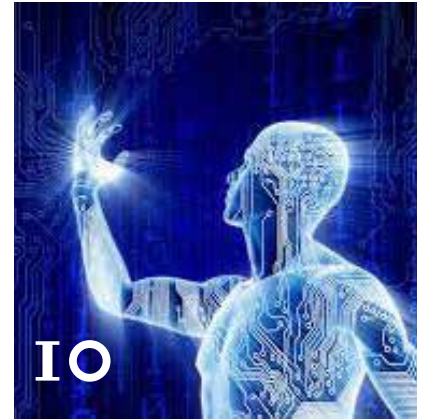
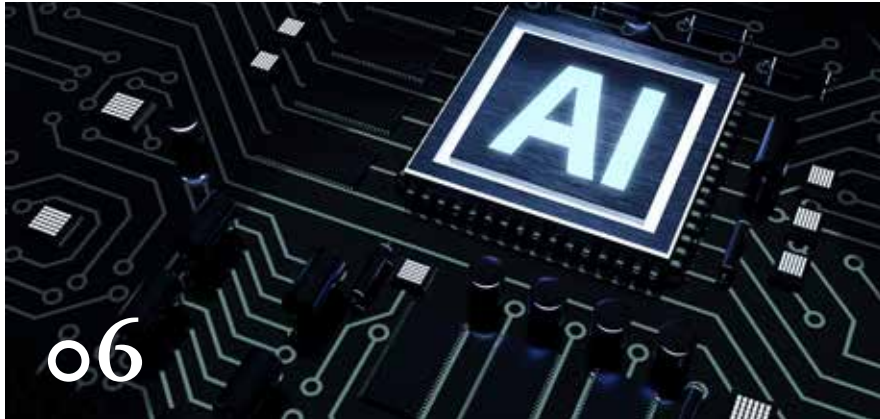
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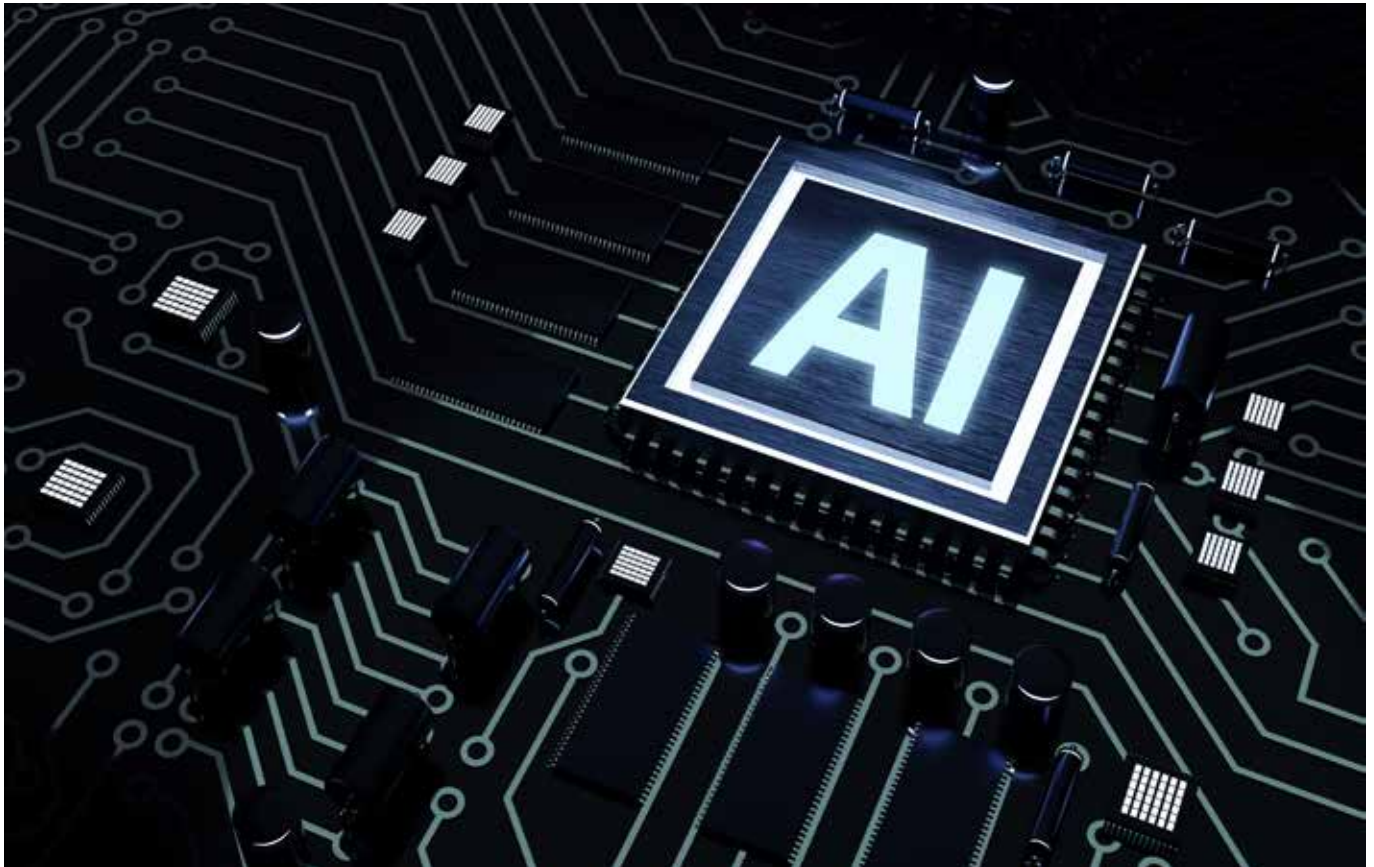
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Column of Daan van Strien (Chairman Industria) & Lynette Haksel (Educational Officer Industria)



What is ESCF? Why is data so important within a supply chain? And what could be the roll of Artificial Intelligence (AI) in the future? To answer these questions, SCOPE spoke with Tom van Woensel, Director of ESCF; Roeland Baaijens, executive vice president global logistics at Hilti; and Joeri Kuik, vice president of global supply chain management at MediaMarkt.

TEXT Stefano Dimastrapasqua DESIGN Caitlin Riesewijk



ESCF: *Evolving the supply chain together*

European Supply Chain Forum, also known as ESCF, is the leading collaboration forum in solving practical and scientific supply chain challenges. Tom van Woensel: 'For me, ESCF is an ecosystem in which we try to work with companies and the university in a long-term, sustainable way. Our ultimate goal is innovation in supply chains.'

The interaction between members of the ESCF ecosystem enables further knowledge development in and around supply chains. ESCF does so by organizing events like masterclasses and workshops, and sharing results of finished or ongoing research within their ecosystem and thus among their members. Currently, ESCF has 35 full members and 39

community members. Full member organizations have access to all the workshops and masterclasses given. Moreover, full members have so called 'executive meetings' where executives discuss relevant topics. As a member of a community, companies only have access to the events which are organized within that community. There are 4 communities, namely:

Customer-Driven Transformation (CDT), Data 2 Move, High Tech (EHTC), and Servitization. Tom van Woensel: 'You often see that a topic recurs in several communities. This is not a bad thing, but it is interesting to be able to show the richness of supply chain from different points of view.'

Besides Innovation, ESCF sets their goals to educate students. To do so, ESCF works closely with the Industrial Engineering Department of the TU/e. Together, they educate Industrial Engineering students by offering master theses - and bachelor end projects at the affiliated companies. Van Woensel: 'For Industrial Engineering students, companies are like laboratories. The Mechanical Engineering Department, for example, brings in a DAF truck and students can tinker with it. We just cannot do that as Industrial Engineers. Our laboratory is a company.'

Talent-Knowledge-Network

There are three buzzwords within the ESCF ecosystem: Talent, Knowledge and Network. The talent pillar of the forum regards the students. Because of the collaboration between ESCF and the IE department, ESCF has access to students which can do a master thesis at one of the members of ESCF. According to Roeland Baaijens, this is one of the most important reasons Hilti is a member of ESCF. Baaijens: 'For us, being a full member is just a small investment to get two or three good students each year. Of course, we hope students stay after their thesis and come work for us.' For MediaMarkt, the students are also of great value. Joeri Kuik: 'We give master students a chance to look within an e-commerce and



retail company. On the other hand, we learn a lot from them, and we can implement their results or continue the research.'

However, for MediaMarkt the talent pillar is not the main reason they are a full member of the ESCF ecosystem. With all the affiliated companies, ESCF has a big network. Companies get the chance to talk with peers from other companies, sometimes even with companies outside of their own industry. Currently, MediaMarkt is remodeling: it is switching from a traditional retail company with decentralized warehousing to a higher focus on e-commerce retail with centralized warehousing. Because of the network of ESCF, MediaMarkt can easily get advice from other retail companies such as Jumbo or Ahold Delhaize, to make their transformation successful. Roeland Baaijens confirms that the network can be advantageous. 'I see colleagues

from ASML, DAF, Shell and DHL, with whom I developed a relationship resulting in easy information sharing when you have a question.'

The last pillar of ESCF, knowledge, is based on the results of research done by students and professors. Moreover, there are workshops, meetings and webinars where new, practical supply chain knowledge is shared. Baaijens: 'Every time I go to an ESCF meeting, I come back with one or two points that make me think: I need to look into this. It encourages me every time to broaden my horizon. So, for Hilti, it is a very important source for innovation in our supply chain.' One of the examples given is the research of Philippe van de Calseyde. In his research, Van Calseyde examined the added value of a planner and the automation process of the planner's daily work. He concluded that a planner typically has added value in certain tasks, but

'Our laboratory is a company.'



in other tasks it is better to use an algorithm. Afterwards, Hilti did the same research, came up with the same results and started applying it immediately. Nowadays, Hilti has 200 planners worldwide to whom they teach what their added value is in their daily activities and what should be done by an algorithm. Also MediaMarkt experiences benefits from the conducted research at ESCF. Kuik: 'Results of research are shared about, for example, the last mile. So, how can you influence the behavior of certain customers? Is that only possible with money or could you also do that with sustainability? This type of research obviously helps us to get on a fast train to conduct research for ourselves and improve our organization. Moreover, we can learn certain things from Ahold Delhaize for instance. The knowledge is already there and has

already been researched. We don't need to invent everything ourselves and can sometimes just benefit from it.'

Data in supply chain

Next to the three buzzwords of ESCF, another word becomes more and more relevant within the organization: data. Data 2 Move, one of the communities of ESCF, focuses on the use of data in supply chains. Academics, students and members collaborate to use data to advance knowledge on supply chain optimization. In the supply chain of Hilti, data is of high significance. Hilti has an end-to-end supply chain; which involves the process in its entirety. Starting at the procurement of materials from suppliers and ending with the product reaching the customer. All their data is stored in one ERP system which supports

fast decision making. Take for example the customer orders. When a customer orders before 16:00, their order will be delivered the next day. Orders are monitored real-time throughout the whole supply chain. This helps Hilti intervene timely and precise. Baaijens: 'Imagine we have 6.000 orders in Oberhausen and 400 orders didn't make it because of a disruption. Back in the days, we found out afterwards. But now, in the digital age, we can solve quite a few of the 400 before the cut-off time and everything will still be delivered to that customer on time.'

Besides fast decision making, data is also of great importance for research. MediaMarkt makes use of Teradata, a popular Relational Database Management System, which involves all data of the organization. This could be considered a gold mine for

a researcher. Kuik: 'We need to let the data speak for us, which we are doing far too little now. That's where ESCF could help us, together we should concentrate on what is interesting to investigate and how we can take steps forward as an organization.'

AI, planner of the future

ESCF, the department Industrial Engineering and Innovation Sciences (IE&IS), the Eindhoven Artificial Intelligence Systems Institute (EAISI), and the Logistics Community Brabant are all working together on the new research program: 'AI, planner of the future'. With this program, all parties want to investigate how AI can shape the role of a planner. Van Woensel: 'There are autonomous cars where you, in extreme cases, do not need any driver anymore. If you try to apply the same analogy to a planning function, at some point you do not need the planner anymore. Is that appropriate?

Do you want that? If so, how do you get there? If not, what are the reasons for not doing it? Are they ethical, or practical in terms of data? These are the questions we try to answer.'

The research program started on September 1st, 2021 and should take about five years. Ten PhD students will all investigate a different domain, such as digital twins, ethics, IT, and logistics warehousing. The question if AI eventually takes over the planner function is still unanswered. Baaijens: 'The planner knows, for example, that the Dutch national team is playing on Monday evening, and can adjust the available capacity or forecast accordingly. There are just so many factors that need to be considered that an AI cannot know.' For MediaMarkt, AI is not something they should focus on at the moment. According to Kuik, the retail company should focus on the

current methodologies and heuristics. Improvements are still needed before MediaMarkt can move towards the new technology. However, Kuik also thinks that MediaMarkt should be ready when the time is right. 'We really need to get those data scientists on board. Our biggest threat is that we do not become successful in it. That competitors employ much better talent and can apply the technology more successful.'

For a platform where innovation is key, AI is definitely a new research topic. However, if AI will be the future is unknown, but one thing is for sure: ESCF will find out in 5 years.



Tom van Woensel

Tom Van Woensel is Full Professor of Freight Transport and Logistics in the OPAC (Operations, Planning, Accounting and Control) group of the department of Industrial Engineering and Innovation Sciences at the Technische Universiteit Eindhoven in the Netherlands. He is also the director of the European Supply Chain Forum.

Joeri Kuik

Joeri Kuik is the Vice President, Supply Chain Management at MediaMarkt since 2019. Here he leads the whole supply chain division. He is responsible for supply planning, perpetual inventory, warehousing, transportation, last mile, returns and store logistics. Before coming to MediaMarkt Joeri worked at DHL as Vice President – Global Head of Lead Logistics Partner.



Roeland Baaijens

Roeland Baaijens is Executive Vice President Global Logistics at Hilti. He graduated Industrial Engineering in 1991 at the TU/e. At Hilti, he is globally responsible for demand & supply planning, warehouse, transport and customs activities.

Artificial Intelligence (AI). Some, if not many, fear the loss of jobs or have the apocalyptic Hollywood view of robots taking over the world. The added value that can be provided by these algorithms is sometimes stubbornly ignored. Artificial intelligence is everywhere in the world around us, and is becoming increasingly important, both in B2C and B2B organizations. This article will explicate the usage of AI in relation to the fourth industrial revolution.

TEXT Niek de Jong **DESIGN** Caitlin Riesewijk



The Fourth Industrial Revolution

How artificial intelligence changes both the B2C, as well as the B2B market

Starting in the late 1700s, the first industrial revolution motorized production with the usage of water and steam power. Electric power was used in the second revolution to initiate mass production and the third added information technology to automate these production processes. Today's fourth revolution might seem as a prolongation of the third revolution, but is inherently different in velocity, systems impact and scope. The speed of current innovation is non-comparable to previous events and, besides, almost every industry is affected worldwide. Standing still is the fastest way of moving backwards in a rapidly changing world, is a saying that is heard a lot in innovation, which definitely heralds the fourth industrial revolution. The possibilities of the fourth revolution

are facilitated by emerging technologies in the field of robotics, internet of things, nanotechnology, quantum computing and artificial intelligence. AI is already everywhere in the world around us. Think about self-driving cars, translation software, healthcare assistance and smart farming. Especially the availability of data and increasing computing power enabled imposing progress in the field of artificial intelligence. As mentioned before, almost every industry is affected, both in the business to consumer (B2C) and business to business (B2B) domain.

When people think about artificial intelligence, the main focus is towards B2C organizations. Think about the automated chat robot that answers your basic banking

questions or the Netflix AI that provided you with your favorite movie yesterday evening. However, the B2B field has much to gain from AI as well and is increasingly using it.

AI in B2B and B2C

At the core of every organization are the products and services they produce. AI can support the development of new or the improvement of existing products and services. For instance, AI tools from Siemens that assist in radiology and thereby increase the quality of images. Step-by-step instructions are provided by the AI to the radiologist based on a combination of patient data and machine observable factors. This way, Siemens was able to improve their products in the B2B domain by the usage of AI. Further, Salesforce, the world's

number one customer relationship management platform, uses natural language processing capability and predictive analytics as AI tools to catapult sales and marketing services. This can be used to increase efficiency and quality while it simultaneously reduces costs. Although the advantages seem prominent and AI is already being used by some companies in the B2B setting, general implementation lacks behind on the B2C domain. Generally, it is believed that B2B organizations experience specific difficulties using AI in their business model compared to B2C.

Difficulties of B2B

Lets face it. When surfing online and a company like Facebook or Amazon asks for consent, you check the box almost without thinking just to be able to use the site. As you probably know, you agree at that point with sharing your data with those companies. Data that they can use to develop their AI's. Most customers will not read a 20 page legal document before entering the service and finding out what they are actually agreeing to. This might seem somewhat logical for you and me as a consumer, as our data is less sensitive than that of big organizations and institutions. That's where the first difficulty for B2B organizations comes in. Imagine you own a company specialized in security systems at highly secure places. You want to make use of AI to train your detection software with the data gathered at the sites of your clients. Your clients will probably not allow such information sharing, and if they do, it will become a highly specialized data transfer agreement. This not only makes the gathering of data increasingly difficult, but also makes



it harder to train the AI because of the high variety of data. The models might even get biased towards the type of clients that are willing to transfer data. Because of the aforementioned reasons, this is a lesser problem in the B2C domain. Besides, in B2B, the amount of data sources is generally substantially lower than in B2C. Google and Facebook have billions of users, which allows them to gather enormous volumes of data. Which, in turn, enables them to more correctly train the AI or machine learning models. Generally, this is also linked to the amount of revenue. Take for example the security company again. They might obtain a revenue of 50 million euros from just 20 customers, while the average B2C company needs thousands and thousands of customers for that amount of revenue. Meaning that companies of approximate the same size in B2B have a way harder, if not impossible,

job of gathering enough data for their AI program.

Lastly, B2C companies using AI tend to be more digitally native. Take for example Apple, Google and Facebook again. Those companies were founded in the digital age and are therefore build around the technical underpinnings that are required to have a culture of data science. In contrast, the B2B world often consists of more conservative organizations in for example the oil, construction and manufacturing industry. The larger organizations in such sectors are commonly over 50 years old, which generally makes it harder to keep up with all the new digital advancements and transform business processes.

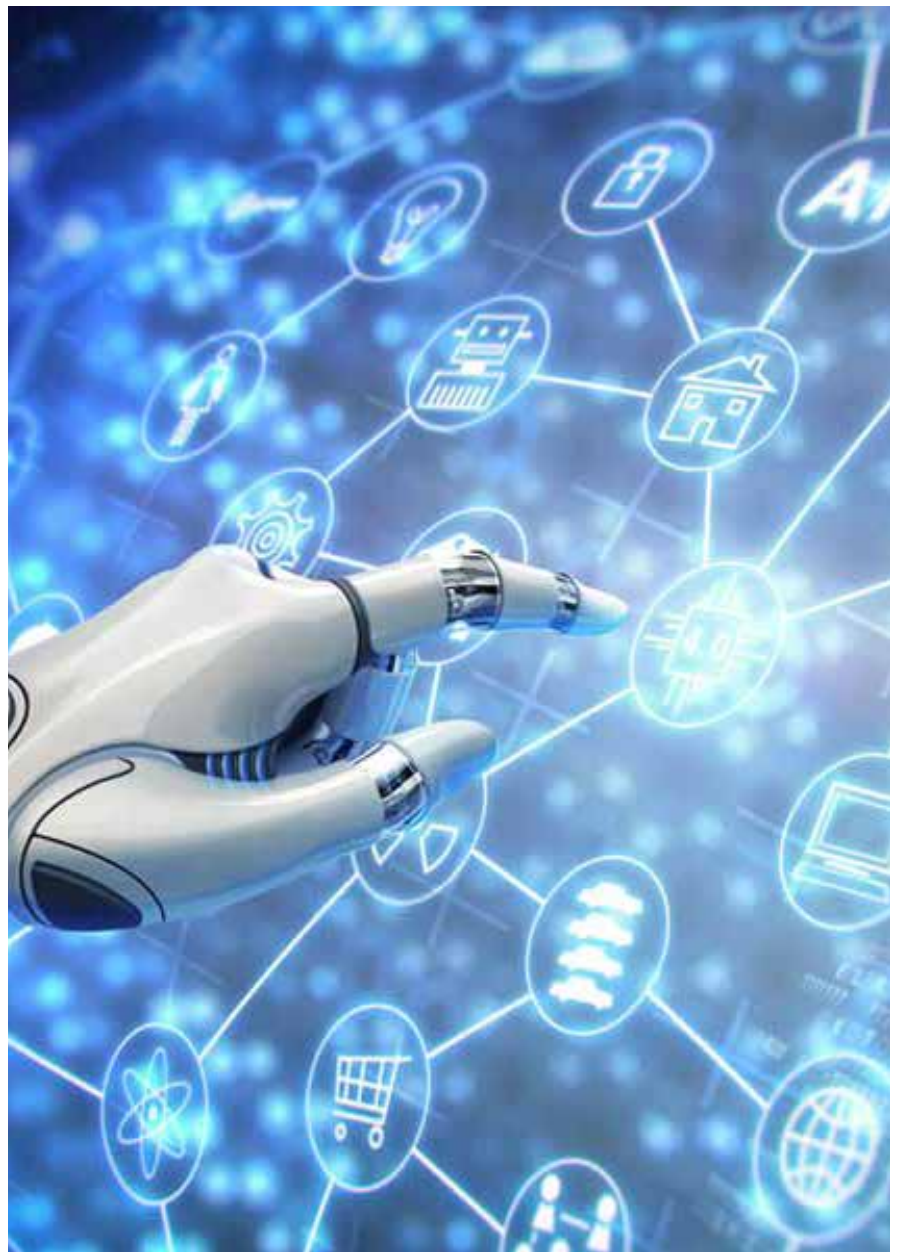
The black box problem

One of the characteristics of an AI solution cast a problem for B2B companies that is inherently hard to

*“Standing still is the fastest way
of moving backwards in a rapidly
changing world”*

overcome, which is called the black box problem of AI and has to do with transparency and interpretability. It often is not explainable how a machine learning or AI model came to a certain outcome and is therefore considered a black box. For companies like Netflix, this not necessarily has to be a problem, as people do not really want to know why the AI recommends a specific movie to them. Moreover, those companies will feel lesser obliged to provide an explanation as they have millions of individual customers. However, when taking the example of the security firm again, the clients will highly likely want to know how the AI works that protects their valuables. In addition, losing a customer because of the unexplainability has a much bigger impact.

As can be seen, there is much to gain from the digital world. Yet, it is used for a variety of reasons and it has to find its use in every part of society. The fourth revolution mainly benefited the people that have access to the digital world. Like its predecessors, this revolution has the potential to increase prosperity all over the globe. But, many obstacles have to be overcome in both the B2C and B2B domain. When AI is used as complementary to our human empathy, creativity and care, it will bring us to great lengths and no one has to fear the Hollywood view of AI.



The wizard of Oz' Tin Man

How did artificial intelligence come to be? At the start of the 20th century, the world got introduced to the topic by science fiction. The Tin Man character from the musical and fantasy film *Wizards of Oz* was, for example, a living robot with a quest for a heart. Nonetheless, scientifically, the quest towards artificial intelligence as we know it today, started at a conference at Dartmouth College in 1956. Interest was awakened at governmental, scientific and business level. Hundreds of millions of dollars were spent, but the achievement of actual artificial intelligence was underestimated. This led to the so-called AI-winter in which funding was cut and almost no progress made. Due to new applications of powerful hardware and the collection of colossal datasets, AI was permitted to flourish again in the 21st century. Where science fiction movies still reign supreme with AI as their starting point, it nowadays also got its useful applications.

DREAM BIG

HÉT MANAGEMENT TRAINEESHIP VAN JUMBO

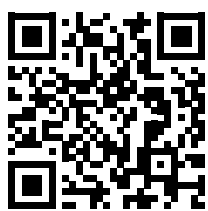
DAAR WAAR ANDEREN STOPPEN, GA JIJ VERDER.

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Klinkt goed! Maar wat hebben we dan van jou nodig? Jij bent iemand die impact wil maken, op anderen en vóór anderen. Jij zet nét dat tandje extra en wil écht winnen. Want daar waar anderen stoppen, ga jij verder. Jij zoekt steeds weer naar uitdaging. Jij wil de retailwereld op de kop gaan zetten. Jij wil winnen!



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JUMBO
Daar gebeurt het!

Take a moment to imagine the following; You are with your friends at an exciting amusement park with a cold and bubbly can of beer. Sounds good, right?

Probably you are not thinking about who made the roller coaster you are waiting in line for, or how sustainable your beer is. Luckily for us all, Vekoma Rides and Heineken and their close collaborations with their supply chain make sure you do not have to think about this. We talked to Rob Steens from Vekoma Rides and Marc Bekkers from Heineken to give us insights in their supply chains and how they make them more safe and sustainable.

TEXT Vita Broeken DESIGN Caitlin Riesewijk

Long-term partnerships for strong and sustainable supply chains



So let's go back to the waiting line of the roller coaster, with your can of beer in your hand. It already travelled a long way to get to you. Starting with the farmers producing barley, which is turned into malt in a malthouse. In the Heineken breweries this is used to create the lovely and bubbly

beer, before it gets bottled, stored, transported and sold to you. This process is large, and covers multiple countries and even continents.

Marc tells us about how they work, starting at the barley. There are two ways they purchase barley, either

directly from farmers, but mainly through large corporations. They collaborate with them to establish sustainable practices. In the case of Heineken specific varieties of barley are developed and grown to brew beer. As such Heineken can more easily influence best practices, and

participate in round-tables. These are collectives of food retailers or producers to discuss ethical and environmental issues in the supply chain.

To create the beer, barley is processed in the malthouses. Heineken has quite a few of their own, but also partners with malthouses they have worked with for many years. These partnerships are very important, Marc explains, as they aim for long-standing relationships. The sourcing of the barley and the partnerships with malthouses are as much as possible situated locally near the Heineken breweries. Creating a local impact and reducing emissions in transport.

Once the malt enters the Heineken facilities a sustainable brewing process starts. In large containers the malt is combined with hop, yeast, and water to create the lovely beers. Part of Marc his job is to plan how much beer is brewed and bottled, to make sure no beer goes to waste. The majority of their locations are zero-waste, collaborating with partners to use left-overs materials for animal feed or sanitizer (especially during corona). By 2025, they aim for all their own production facilities to be 100% circular, and by 2030 to be carbon neutral with net zero emissions.

You are near the end of the waiting line, and your beer is finished. Heineken even considered the end-of-life of all their cans and



bottles. The cans of Heineken are made of recyclable aluminum, and the bottles can be returned to any collection point. In their Brew for a Better World report they share their plans to maximize circularity, moving towards “reduce-reuse-recycle”. So every time you return a crate of beer, you are helping to make beers more circular.

Now it's time for the exciting ride. Rob tells us about the different types of steel in a rollercoaster. The vehicles require the highest quality of steel, whereas the columns on which the rollercoaster stands can be made of a lower quality, or even

a recycled form of steel. When designing the roller coasters, the engineers calculate the strength needed which can be translated into the quality of steel required to optimize the lifespan of the rides. This is discussed with their suppliers, who offer several solutions. In sector collaborations, standards are developed for the quality of steel, and the regulations that come with this quality. These standards differentiate over countries and continents. Together with their suppliers, Vekoma Rides engineers then collaborate to create safe and sustainable rides.



Marc Bekkers

Heineken is a Dutch beer brewer, famous for their green bottles sold all over the globe. Marc Bekkers is responsible for Supply Chain Planning worldwide and started at Heineken roughly 20 years ago. He studied at the TU/e, and after a few jobs abroad he started working at Heineken. He tells us about his favorite project, working for the Rugby World Cup in Australia, making sure all the thirsty rugby fans got their cold beers in time. He is a big sports fanatic, and this project was an amazing challenge.

“We want keep the rides going and keep customers happy.”

Vekoma Rides either builds the parts for the rides themselves, or they collaborate with partners. When collaborating with partners they choose locally, to improve contact and sustainability. They themselves have production facilities all over the world, working with the same sustainability (social and environmental) policies. Additionally, Rob tells us how the production of the parts has changed over the past years, moving from welding to prepped parts, which changes how the rides are constructed. Creating the exciting ride you might now be imagining.

While being pulled up the roller coaster (you know, with loud tick tick tick sounds), you have some time to look around, experience the atmosphere, or just be really scared. The theme of the ride is developed together with the client, the amusement parks. Rob, like Marc, emphasizes the importance of long-term collaboration to thoroughly understand each other's business and to act sustainably.

When a ride gets old-fashioned, or doesn't have a lot of value for the amusement park anymore, Vekoma Rides facilitates the connection between the amusement parks who are interested in adopting and relocate these kind of rides. Adjusting the theme according to the wishes of its new owner and making it safe and exciting to take the ride again. Here Rob is very clear: “We believe our network has value, but we do not want to profit of this. We want to keep the rides going and keep customers happy.”

Now the exciting ride is done, and Rob tells us about their future plans, to move towards a service-oriented business, maybe while enjoying a Heineken beer.



Rob Steens

Vekoma Rides is part of a multinational organization Sansei Technologies which you know from Python at Efteling, Condor at Walibi Holland, or maybe Space Mountain in Disneyland Paris. Rob Steens works at the customer side of Vekoma Rides, where he started in 1999. He studied at the HTS in Heerlen, and has since grown to love the technical but informal atmosphere of the amusement park industry. His favorite part about his work is the smile of the many visitors after they enjoyed a Vekoma ride. In his own words: “It's magical”.



For the past years, the amount of Dutch breweries has been rising significantly. Whereas there were ‘only’ 165 breweries in 2012, now there are over 600, including both the well-known multinationals such as Heineken and AB InBev, as well as small-sized start-ups. In addition, the Dutch beer market has experienced a strong growth in the sales of specialty, non-alcoholic and craft-beers. However, within such a dynamic and competitive market, how can supply-chains be effectively coordinated? What challenges do retailers and breweries experience, and what role do their consumers play in solving this? SCOPE spoke with Marco Willemars about the coordinating role of branch organization ‘Nederlandse Brouwers’ in the return chain of empty beer bottles.

TEXT Robert Geurten **DESIGN** Caitlin Riesewijk

SCOPE visits.. Nederlandse Brouwers

Beer bottles: from industry standard to a distinctive product

On a rainy afternoon, mid-August, we digitally meet Willemars. After having worked within AB InBev for almost 25 years, fulfilling diverse positions in the field of supply chain optimization, returnables and materials planning, he founded his own company five years ago. Willemars: “For the past years, I have been working closely together with Nederlandse Brouwers as an external subject expert on supply chain planning and returnable asset management.” To do so, Willemars works together with Eric Veldwiesch, Manager Sustainability at Nederlandse Brouwers, as well as specialists from the key breweries. As far as returnables are concerned, this mainly concerns empty beer bottles, which are handed in by consumers at a supermarket. Willemars: “As you may already know, after being washed and relabeled, beer bottles are being refilled by breweries. Hence, glass bottles may be filled up to twenty times before reaching their end of use. Traditionally, Dutch beer brewers used to operate an industry-widely adopted bottle: the notorious, brown tinted exemplar. While this offered them few possibilities to personalize

their packaging, it made the return chain rather straightforward. After all, any bottle could be refilled at any brewery.”

However, for the decade or so, breweries have gradually started to introduce their own, individually branded, refillable bottles. Think for instance of Bavaria, which used to offer its pilsner in a regular bottle, but decided to step away from this two years ago. Willemars: “This transition resulted in several challenges for the breweries. First of all, bottles can

be distributed less interchangeably, since there are simply more different types of them in use. Secondly, it has proven to be more difficult for consumers to decide which bottles may be combined within one crate.” As a result, the return process in which empty bottles are distributed from the customer back to the breweries has become more error-prone, costly and less productive.

The return process explained

As Willemars explains, the bottle return process can be divided into





During their Bachelor End Project, Pauline and Daan analyzed the beer bottle return

five (sequential) stages. First of all, there is the consumer, who delivers the beer bottles (in a crate or as a single bottle) at a local retailer store. Afterwards, the second step involves the intake machine at the retailer, which either accepts or rejects the crate(s) and/or bottle(s). In step three, a retailer employee collects the individual items and stows them on a roll container. Fourthly, from the supermarkets, the filled crates are distributed to the retailer's return center, where all crates are collected and sorted on pallets. Finally, from these warehouses, the crates are taken to the breweries, in which the bottles are cleaned, refilled and relabeled, being ready to be distributed again.

During the past semester, Industrial Engineering students Pauline Fonteijn and Daan van Strien conducted their Bachelor End Project (BEP) at Nederlandse Brouwers. Their research aimed to obtain more insight in potential interventions which may be taken to optimize the return process. Although every step offers this possibility, one student focused on the role of the consumer (i.e. how does the customer experience his or her role, and are any difficulties or impracticalities being faced), the other analyzed the retailer employee's role.

Process optimization: one cases, multiple interventions

Willemars: "By means of a survey, we learned that in general, consumers are keen to correctly sort out their bottles, even when they do not receive a tangible reward for this. The notion that merely by correctly sorting and returning their beer bottles, they add significantly to circularity and sustainability is enough for many to cooperate. On the other hand, a substantial amount of respondents indicated that often, they are not sure which bottles may be combined. In addition, a substantial amount of consumers is not sure whether it is possible to get a deposit on the bottle. Therefore, we considered how consumers can be better informed. In other words: how can we increase the amount of 'right first time' bottle placement, without causing extra

barriers for consumers?" A rather straightforward possibility could be to depict instructions on the bottle, crate or six-pack package, displaying information whether the bottles are returnable, or made to be disposed in a glass-recycling container. Furthermore, a more technically advanced solution to equip the bottle return machines in supermarkets with scanning software, preventing crates with various kinds of bottles to be accepted. Already quite some newer machines have this ability, also to communicate with the consumer via the machine display.

With respect to the role of employees, Willemars explains that Nederlandse Brouwers is collaborating with supermarket chains to help with staff training and knowledge. During our interview, he displays a poster including a QR-code, which graphically shows which groups of bottles may be combined together. Furthermore, additional training for the employees could help: even if the customer incorrectly presents bottles or crates at the vending machine, the employee is able to detect this and sort properly. One of the main recommendations of Daan's research, was to pay more attention in informing the management teams of supermarkets. At the end, they are the ones instructing their personnel. Willemars: "in general, retailers are fairly interested to cooperate with us on this case, since a more efficient



process is in both our interests. To make our chains more sustainable, we depend on each other's efforts and we should work close together. An improvement to the current process, would be to insert a feedback loop from the brewery to the retail management, in order to learn from potential mistakes and improve right first time bottle return. As part of this, supermarkets obtain information on the amount of incorrectly filled crates and bottles, which enables them to take appropriate measures."

Returnable or disposable bottles?

Do our neighboring countries experience the same challenges? According to Willemars, the variation in beer bottles is significantly higher in Germany than in The Netherlands, due to the high amount of small-scale, local breweries. Therefore, the bottle return process is more complex as well. In Belgium, on the other hand, a major retailer still manually fills crates

with returned bottles, shifting the process of properly sorting the bottles from the customer to its employees. And what about the hospitality industry? Do bars and restaurants still offer major room for improvement? Willemars: "hospitality staff is usually better aware of how bottles should be recollected, than the average consumer. Moreover, the filled crates are often picked up and transported by the beverage wholesaler, performing an additional check.

Plenty of the small-scale, local breweries within the Netherlands, of which many have been founded during the past decade, have decided not to market refillable bottles. Willemars: "for a brewery, investing in a returnable bottle system not only means checking if the right type of bottle is returned, it also includes the necessity to clean the bottle from dirt, inspect for any damages and relabel. All in all, for most start-up breweries these

investment costs are too high."

It is clear that after you have finished its content, your beer bottle's journey has not come to an end. While the return process of beer bottles and crates may be mostly invisible to the average beer lover, it forms an interesting and challenging case for all players in the return chain to distribute the right bottle to the right manufacturer. Nederlandse Brouwers fulfills an overarching role, by stimulating collaboration and knowledge transfer between breweries, retailers and consumers. Not only does this bring added value in terms of sustainability, it also makes the chain more cost-efficient.



Nederlandse Brouwers

Nederlandse Brouwers is the branch organization for Dutch breweries, representing the interests of 13 members, covering 95% of beer production in the Netherlands. Nederlandse Brouwers aims to enable its members to produce and sell freely, cost-efficiently and responsibly in their markets. In order to do so, it mainly focuses on the domains of Responsible Beer-Consumption, Economics, Taxation and Legal Affairs, and Sustainability and Chain Management. Members include well-known multinationals (e.g. AB InBev, Grolsche Bierbrouwerij, Heineken and Royal Swinkels Family Brewers) as well as more local breweries, such as Brouwerij De Leckere, Brouwerij Noordt and Two Chefs Brewing).



Marco Willemars

Currently living in Breda, Marco Willemars studied econometrics at Erasmus University in Rotterdam. After having obtained his doctorate, he fulfilled several positions within AB InBev; one of the world's largest brewing companies. As a result, Willemars gained extensive experience in the field of supply chain planning and optimization, in particular in the field of circular supply chain management. For the past five years, he has been working as an independent consultant on circular supply chains, in close collaboration with Nederlandse Brouwers.



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and mechanical modules contribute
to future technologies.*

Accelerating the future



ASML is a leading manufacturer of lithography systems used by the world's top chipmakers. The company has around 5,000 suppliers, which results in complex supply chains. Robin de Jonckheere, ASML supply chain management trainee, talks about optimizing processes within different departments and the impact of COVID-19 on ASML's supply chains.

TEXT & DESIGN Caitlin Riesewijk



Supplying ASML

The volume of systems produced at ASML is relatively low, but complexity and time pressure is high. As the world's leading supplier of lithography systems for chip manufacturing, ASML's customers are fast-paced and demand high quality. This contributes to a dynamic supply chain environment. ASML works by the principle of just-in-time manufacturing, resulting in a heavy reliance on its supplier network. Within this principle, the biggest challenge is to ensure that the focus is placed on all parts of the supply chain, not only the complex ones. One missing screw can cause a system to go offline, which can rack up significant downtime costs. To manage these supply chains around the world, it is key to have innovative planning and control processes. An example of such an innovative process which has just been rolled out at ASML is the Supplier Manage Inventory (SMI). Within this process, ASML no longer places orders but instead sets a range of stock levels that the suppliers must maintain. The main task of Robin

de Jonckheere, ASML supply chain management trainee, is to optimize the processes within these complex supply chains by maximizing speed and flexibility.

Robin de Jonckheere

As a trainee, Robin has worked at three different departments in ASML: Operational Supplier Management, Customer Supply Chain Management and Product Life Cycle Management. Within these departments, she has been exposed to day-to-day operations and uses this hands-on experience to tackle issues through improvement initiatives.

"I'm currently an operational supplier manager, and my main task is to ensure that the factory is always working," Robin explains. "This includes finding innovative options if suppliers cannot deliver parts on time. But more importantly, the key focus of this role is improving the performance of your suppliers. This can, for example, be finding root causes of late deliveries,

but also to sit down with the supplier to discuss whether production capacity can be increased to support a ramp-up.

"At Customer Supply Chain Management, next to ensuring servicing availability for our systems around the world, my goal was to optimize automation so that manual intervention would be required less.

"And at Product Life Cycle Management (PLCM), I worked to make the development of the latest ASML system a success. As a project coordinator – the role I took up – you are the link between teams, ensuring timely development while safeguarding the design quality. How you do this is up to you. It requires a lot of creativity. Each part of the machine is different, so different strategies might fit best. This requires close contact between the Logistics and Development and Engineering departments of ASML, but also with external design agencies and suppliers."



ASML has high quality standards for the components of their systems. As Robin explains: “Sometimes I thought, ‘Why does it take so long to deliver those little screws?’ When visiting the factory, I saw a man sitting behind a microscope checking all the screws one by one looking for small burrs. If there are burrs in the screws, they do not meet the required quality. This makes you understand potential bottlenecks of suppliers and why things can take so long. In principle, optimizing the process would be up to the supplier, but you sit down with them to see how it can be improved or how this could be done faster if it were necessary.”

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process would be up to the supplier, but you sit down with them to see how it can be improved or how this could be done faster if it were necessary.”

The COVID-19 crisis

Due to COVID-19, it was suddenly much more difficult for ASML to send systems, service materials and people around the world. The biggest operational challenge was the reduction in flight capacity. ASML’s systems are often transported to customers by airplane carrier as this is the safest and fastest method for the ultra-sensitive equipment.

The worldwide travel bans also made it very difficult to place emergency shipment orders. To solve this problem, Robin was responsible for adjusting the operational management planning to focus on the essential parts only.

Another challenge was that ASML engineers could no longer travel. To solve this problem, ASML utilized virtual reality through smart goggles, instated processes for remote certification and trained employees in the requirements for this new method of certification. In this way, using the goggles, employees

in the Netherlands were able to remotely monitor and support colleagues, partners and customer employees on the other side of the world. ASML plans to continue to work with these goggles

Working experience

Robin’s experience of each department was very different. “At PLCM, I was really in my element. Collaboration was central to the work and I really felt connected to my project. We had a common goal to deliver this particular system on time,” she shares.

“The department I’m in now is much more of a challenge. There is a lot of focus on short-term issue resolution to keep the factories running. I learn a lot in this department and despite it being very busy, everyone is always really supportive.”

“ASML is a big company with many possibilities, and through this traineeship you have the chance to see a lot of them. There is lots of freedom to take on projects, but you’re also responsible for making sure that you make time for this.”



Robin de Jonckheere

Robin de Jonckheere studied at the Technical University of Delft, with a bachelor in Technical Policy and Management and a master in Transport, Infrastructure and Logistics. During her studies, she also studied abroad at the Pontificia Universidad Católica de Chile in Santiago (Structural Engineering) and the Universidad Politécnica de Madrid in Spain (Roads, Canals and Ports). Her interest in supply chain was sparked while doing a graduate research project at MSD on the determination of a replenishment strategy through cluster identification using machine learning. In October 2019, she started at ASML as a Supply Chain Management Trainee where she has found her place in a Supply Chain role, but also in a high tech environment.

Supply chain disruptions such as worldwide shortages, the blockage of the Suez Canal and local container shortages can have profound impact on a company's operations. Yet many companies have only limited knowledge of their direct suppliers and customers, let alone companies further up or down the chain. Supply chain mining (SCM) is an emerging area of research that aims to increase transparency in supply chains, thereby enabling companies to better react to such disruptions. To understand what supply chain mining is and how it can be applied, SCOPE spoke with Dr. Laura Genga about her research and about the potential of SCM.

TEXT Joost van der Haar **DESIGN** Caitlin Riesewijk



Dealing with disruptions

Achieving transparency within a supply chain can be difficult because companies are hesitant to share sensitive information with other parties in their network. Last year showed that this can lead to problems. "It turned out that not knowing what is happening to your peers also directly affects your own operations as a company," Dr. Genga explains, "because you are aware of delays only when it's too late, and this will also affect your own production and your own delivery". Knowing there is a disruption on time, and having a projection of what this means for your own operations, is therefore crucial to

be able to react to disruptions.

This is where supply chain mining comes in. Supply chain mining is the application of process mining on supply chain data, which comes with its own unique set of opportunities and challenges. It can be seen as a tool to integrate, summarize and visualize the supply chain of multiple companies directly based on data. This data takes the form of already available information, like bills of material, and is obtained from sources ranging from orders to manufacturing and logistics. Each of these sources provides information on events like

ordering, delivering and invoicing of goods. Integrating and analyzing this event-based data enables companies to optimize their inventory levels in a more evidence-based way. It enables them to exploit information that they were previously not aware of. Dr. Genga elaborates: "Information is typically scattered among many different actors and everybody just has a partial vision of it. In theory, it is knowledge that is inside the company, but as long as you don't make it explicit and easy to use, it's simply not used at all". Supply chain mining can bring all these sources of information together, both within and between organizations.

In light of these anticipated benefits, Dr. Laura Genga and Dr. Shaunak Dabadghao are working together with ESCF partners Hilti, Neways and ChainStock on a supply chain mining research project. With this project, they intend to visualize the respective supply chains and analyze disruptions to find out how disruptions affect production at various levels of the chain. These disruptions do not need to be as impactful a global pandemic; the impact of mechanical problems and other production issues on the supply chain can also be worth analyzing. The long-term goal is to build an early notification dashboard, something that can notify users when problems are likely to happen and that is able to provide support in different scenarios. Ideally, it would be able to answer questions like; “What would happen if I do this, and what would happen if I do that?” and “What are the costs and benefits?”. Such a dashboard is however out of the scope for the current project.

Implementing supply chain mining in practice

Not coincidentally, setting the scope is an important part of any supply chain mining project. The first phase of the project focuses on negotiating



which departments of the companies should provide support and data, so that the data can be preprocessed. For this project, this will be done with the help of Master students who get involved through the European Supply Chain Forum. Dr. Genga: “At least in the beginning, these students need somebody who tells them what the company is, what is relevant and how to interpret the data. Because if you don’t work in the company and they give you a gigabyte of transactions data, it is totally useless. So, at least in the beginning, there must a company

supervisor dedicating several hours in the week explaining the master student how to interpret this data and checking the progress of the student.” As this requires a significant investment in time and effort, these prospective supervisors need to see the advantages for their department and workload needs to be negotiated on.

Once the data is understood, preprocessing can start. This includes dealing with general problems such as missing data and the need to make certain assumptions. However, it also



involves problems more specific to supply chain mining such as ‘case identification’ and ‘focus shift’. Case identification refers to the problem of determining which activities should be grouped. Some systems might for example log each time you fill in a field in a form as a separate activity. Other systems draw the line at composing and sending an invoice or do not draw a line at all. Focus shift on the other hand, refers to the problem that it can be hard to track goods through different stages of a supply chain. It can be hard to follow goods when some locations register each product separately, while others store data on a pallet or even container level. In an ideal situation, the available data is already hierarchically ordered into cases and specifics of aggregate products are known, as this would enable analysis on multiple levels. In practice, this is however often a problem.

The last step before analysis can begin, is to then run an algorithm to visualize the supply chain network. While some standard process discovery algorithms are available in scientific literature and while some companies offer others, these are usually not directly applicable to supply chain data due to a combination of the aforementioned problems. Additionally, differences in the way companies record their data might lead to further problems. Adapting one of these algorithms to the context at hand will hence be necessary. Once completed, running the algorithm will then summarize and visualize the supply chain.

From results to actionable insights

The summarized supply chain can be analyzed in two main ways, namely statistical analysis and anomaly detection. Statistical analysis is the most straightforward of the two. It involves analyzing standard processes using KPIs and identifying bottlenecks, such that inefficiencies can be identified and solved. In contrast, anomaly detection focuses on identifying less common sequences of events such that they can be addressed if necessary.

Both types of analysis require a good understanding of the data. After all, knowledge of what alternatives are possible is required before using statistical analysis to classify a process as inefficient. Similarly, distinguishing problematic anomalies from non-problematic ones requires knowledge of less frequent yet standard processes. The system cannot afford to be wrong too often. Presenting a user with ‘innocent’ process anomalies too much could reduce their trust in the system. This both wastes the user’s time and creates the risk that the user will not investigate an identified problem that actually turns out to be legitimate. Avoiding such errors can be challenging. However, if the system works well, it will be possible to use it to obtain actionable insights. These can then be used to streamline processes and address disruptions in a timely manner.

The future of supply chain mining

While being able to exploit such insights is already valuable, many developments are still ongoing in the fields of process

mining and supply chain mining. More and more companies are achieving the necessary level of data quality and as time passes more and more (commercial) tools are becoming available, as Dr. Genga explains: “Nowadays there is much more industrial software for process mining. That simply did not exist a few years ago”. These tools significantly reduce the required investment cost for a company to start process mining or supply chain mining, as it no longer needs to develop this software all by itself.

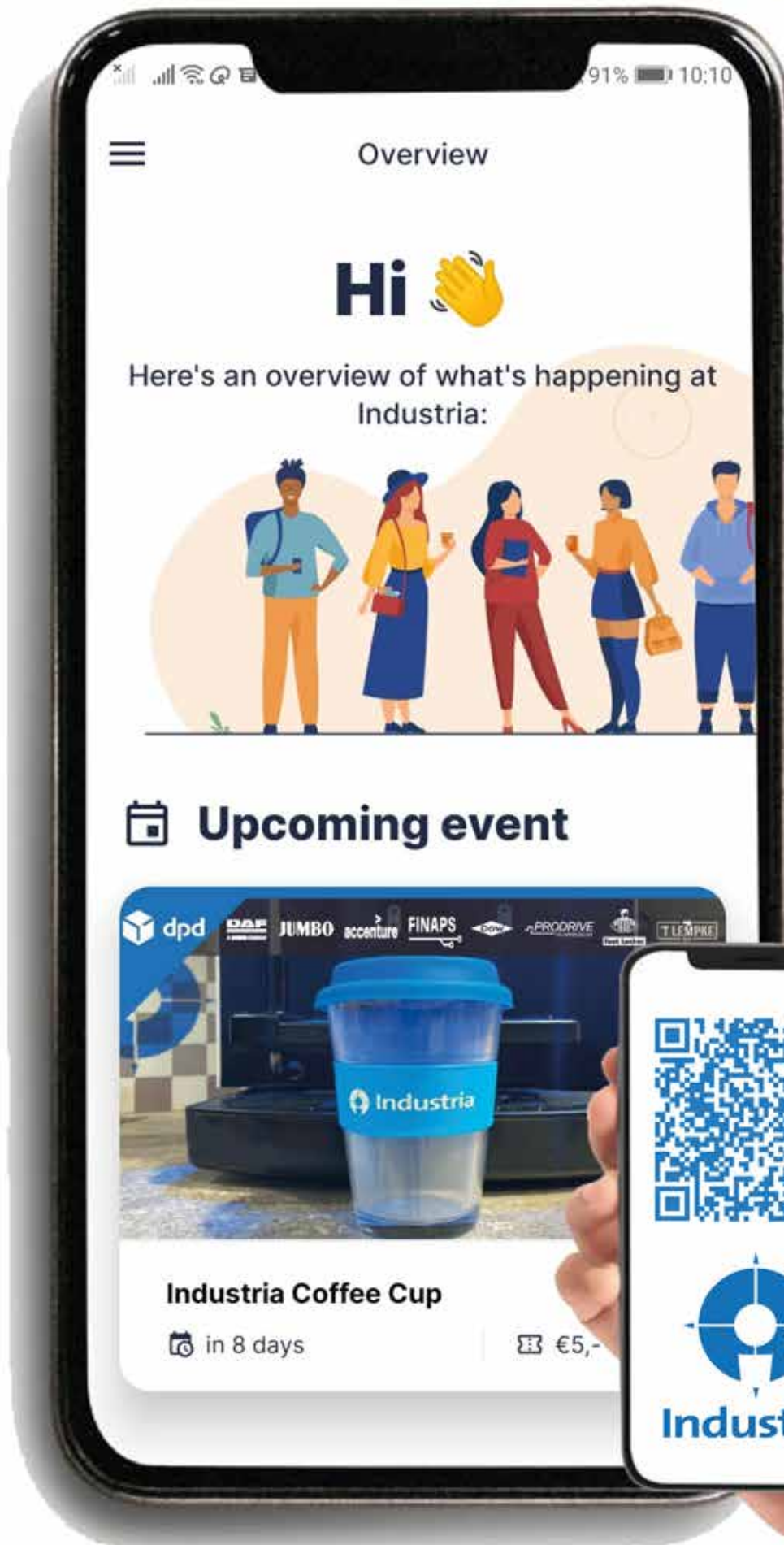
Dr. Genga expects that these tools will not only become easier and cheaper to implement and work with, but also better. It seems likely that AI will play a major role in this, as research into it is becoming increasingly popular. Applications could vary from predicting a client’s ability to pay, to predicting future processes and identifying optimal courses of action based on scenario analysis. At the same time, Dr. Genga also sees challenges: “If the human does not trust the system, if it only is a black box, then you can have a perfect system and people will not use it. You will have invested a lot of money to still have the same problems”. She therefore anticipates a big role for the field of explainable AI. In the meantime, Dr. Genga will continue to work on her current project and get closer and closer to developing an early notifications dashboard.



Laura Genga

Laura Genga finished her Bachelor’s and Master’s degree in computer science at Marche Polytechnic University, after which she finished her PhD in Management and Automation Engineering at the same university. Since then, she has specialized in various aspects of process mining. In 2017, she made the switch to Eindhoven where she has held the position of assistant professor since 2019.

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‘If you have knowledge, let others light their candles in it. ‘ - Margaret Fuller

Crossing Borders: Knowledge sharing within organizations, between companies, across nations

TEXT Nynke Theunissen DESIGN Caitlin Riesewijk

In the last year and a half, it has become clear that contact, communication, and sharing information are essential for all companies and organizations to run. It is not only important for smoothly managing business processes, but also for maintaining human contact and accelerating innovation. During the global pandemic, every organization has had to deal with obstacles around knowledge sharing in a digital environment while working from home. This includes contact among

colleagues, communication between departments, and interaction with the public and other companies or organizations.

The theme of this year's Industria Congress is therefore crossing borders in knowledge sharing. The participating companies will link their workshops and readings to obstacles they have faced, what they have learned and what they see as opportunities for the future in the field of knowledge sharing.

Knowledge sharing is a hot topic for many companies. It has not only been relevant during the pandemic, but it is a subject of all times. The subject is broad and does not only apply to relationships with other companies but also to connections among employees, departments, and international commerce. The theme is therefore divided into three subcategories. Knowledge sharing: within organizations, between companies, and across nations.



Congress committee, from left to right: Nynke Theunissen, Fleur Machielsens, Mauro Colpaert, Esther van Maurik & Pien Levels

Within organizations

Knowledge sharing within organizations can among other things relate to optimizing information systems or sharing information between different departments. It seems obvious that sharing information within companies flows smoothly and efficiently, this is however not always the case. There are often so-called information silos within companies. This means that there is a minimal amount of overlap and knowledge sharing between different departments. All departments do their own work and look out for their own interests. This can lead to misunderstandings, double work, and a negative work environment. Efficiently sharing information throughout the company or organization contrarily can ensure smoothly running processes, a transparent working environment, and it can create an understanding of every department's point of view. The latter will create a more positive atmosphere and it will strengthen a shared company vision. All of this ensures efficiency and positivity in the organization.

During the congress, current situations within the organizations will be discussed. This will include remote working and digital meetings. This is, however, not the only topic touched upon. Situations of the past and future scenarios of knowledge sharing within organizations will be discussed as well.

Between companies

When it comes to knowledge sharing between companies, open innovation is often the first thing that comes to mind.

Open innovation is the process where companies collaborate and exchange ideas in order to achieve innovation. By joining forces these innovations can be out of the box and profitable for the parties involved. In the open innovation process, sharing information and trust is of utmost importance. Without these elements, open innovation cannot take place.

In addition to open innovation, sharing information is also essential for the supply chain. To manage the



supply chain, it is essential that there is effective communication within the network of companies, so that only relevant information is shared. In a transparent supply chain the right information is provided at the right time to the right person. This allows better decision making, a more efficient and secure process, and a more profitable organization.

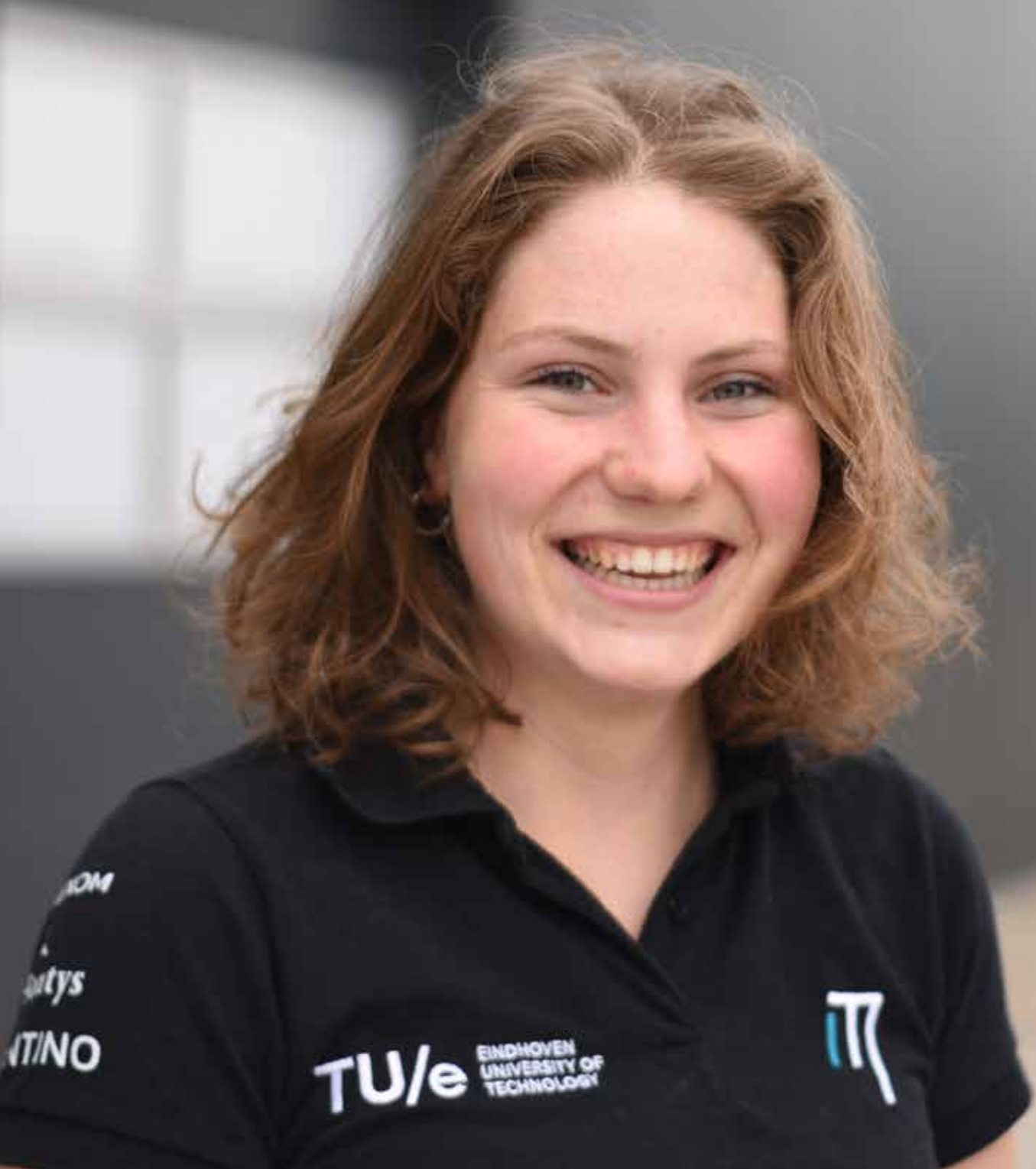
During the plenary readings and workshops at the Industria Congress, companies will explain how they efficiently manage communication within their supply chain. Furthermore, open innovation with partners will similarly be discussed. It will be examined how communication between companies can be improved.

Across Nations

Many companies do not only deal with other companies or other departments within the Netherlands, but also with companies and departments located in other parts of the world. Some have relationships within Europe, others also work with organizations in other continents. For a successful collaboration, it is important that communication and the sharing of

information are professional and skillful. Thanks to modern technologies, more and more is possible, scheduling an appointment with someone on the other side of the world is becoming easier. This makes even the literal borders between countries almost disappear as sharing information can become easier, faster, and clearer. There are, however, cultural differences between countries that influence collaborations. This may lead to miscommunication. To prevent this, it is important to know to whom you are talking. During the congress, companies will explain how they experience this type of collaboration and how they ensure that knowledge and information can be exchanged professionally with the other side of the world. Attention will also be paid to the great advantages that it entails.

On the 23rd of November the Industria Congress is organized. We welcome you to join the biggest Industria career event of the year. Come and listen to two compelling readings, join the interactive workshops, and have a beer while talking to representatives of the companies. We hope to see you on the 23rd of November!



“

Laura van Erp

I grew up in Best, 10 minutes by train from Eindhoven. From a young age, I have been familiar with Eindhoven. When I started looking for a suitable study, I wanted to go to a city as far away from my parents as possible so I could move into a student room right away. But when it turned out that Industrial Engineering was the study that I wanted to follow, because of the mathematical and entrepreneurial aspects, I decided to stay in the area. Brainport has a lot to offer in terms of technology and personal development. And in the end, I moved into a student room

Since last academic year, I have been active full-time at student team InMotion. After finishing my bachelor's in Industrial Engineering, I was ready for a new challenge. A challenge where I could put into practice what I learned at Industrial Engineering and develop my social skills. And I succeeded! Last year I learned a lot, especially things you can't learn at university. At InMotion, I work as an account manager, which means that you are responsible for all partnerships. InMotion is a foundation and therefore completely dependent on sponsorship. This year I have therefore been busy with stakeholder management, technical acquisition, and event organization. Industrial Engineering is very useful in many of these areas.

Fast charging is currently too slow, it doesn't even come close to the speed of refueling a petrol car. And this is one of the biggest reasons why people are not yet buying and driving an electric car. At InMotion, we want to tackle this social problem and thus accelerate the energy transition in the automotive world. We are currently working on an 'Electric Refueling' technique; making charging as fast as refueling a petrol car. In 2023 we will showcase this technology in the 24h of Le Mans, the most prestigious race in the world.

Here, the world will be able to see how charging times don't have to be a bottleneck in racing, and therefore in the regular car industry.

At InMotion I learned that nothing is impossible and that with a lot of passion, motivation, and close cooperation with fellow students and companies you can achieve anything. Together with the team, you work towards an ambitious goal, and when it works as you envisioned it gives a great feeling of euphoria.

Next year I will start with a pre-master Mechanical Engineering. InMotion has made me realize that I am very interested in the technology behind it. Eventually, I see myself starting my own company or working in a start-up/scale-up, something like InMotion but paid. There I would like to combine the skills learned at Industrial Engineering with the technical part of Mechanical Engineering, so you can contribute at any level within an organization.

In short, I would recommend it to anyone to develop themselves alongside their studies at a student team or other institution. It gives you completely different insights, you learn how a company operates and what your place is within it. And you probably also contribute to a sustainable future and social problems. Remember, nothing is impossible!

”

Spotlight

Are you or do you know someone who did something remarkable? Does he/she deserves to be in the spotlight?

Please contact the SCOPE:
SCOPE@industria.tue.nl

Building

On the beautiful day, 28 July 2000, I was born in a very small city, named Engelen, which is located next to 's-Hertogenbosch. Here, I went to elementary school and played football at FC Engelen. I was clearly a talent, since I was scouted for PSV. I still thought a VWO diploma was more important, which I achieved at my secondary school in 's-Hertogenbosch. When I needed to choose a study, Industrial Engineering was immediately the one and only option. However, the choice of the city was a little bit more difficult. With my expected team leadership at Albert Heijn and very close bond with my dad in mind, I chose to study in Eindhoven. In my first year, I was immediately an active member of Industria, since I joined the Belgium Trip and Introkamp Committee. Next to this, I also organised 'PANdemisch Zuipen', together with the Industria Weekend Committee.

During my third year, I was looking for something different than studying after my bachelor. Since I've had a lot of fun over the past three years at Industria and also learned a lot during these years, I decided to become a board member of Industria. I'm looking forward to be the next project manager and put all of my energy (which is a lot according to my friends) in Industria. If you want to know which projects I am going to do or just want to have a nice cup of tea or a beer, just join me in the Villa! And ofcourse, see you all on Thursday evenings in 't Lempke!

Caitlin Riesewijk

Project Manager



There is no lack of money or technology in this world – there is a lack of imagination, Daan Roosegaarde. Rethinking the status quo to improve life and solve issues, that is how companies, such as Studio Roosengaarde and Tony Chocolonely, inspired me to study Industrial Engineering. As an amateur artist with tendency to take on many projects, my studies became more than just studying. I became an active member by joining committees as the educational council, introduction week, promocie, business trip and many more. Besides, every Sunday you could find me on playing at the hockeyfields of Donquishoot. As your next officer of external relations I hope to bring you in contact with interesting and inspiring companies and aim to show how many opportunities there are. Even the ones that might not seem obvious at once. I am looking forward to upcoming year and hope to see you all soon!

Iris Borst

Officer of External Relations

In the year 2000, I was born above the rivers in a small village where they indeed do not know anything about carnival. It is 'beautifully' called Hippolytushoef. During my youth, I did gymnastics and played football. After high school, I decided to move as far as possible and started to study Industrial Engineering in Eindhoven.

In my first year, at intro camp, I decided to become an active member of Industria by joining the Belgium Trip committee. In that year I also developed a passion for The Villa and decided to join the Tappers committee. During the beloved corona period, I found out that I wanted to do something different than studying. I soon concluded that I would like to become a board member of Industria.

This year, I will be the secretary of Industria and I will spend a lot of time on my passion The Villa together with the crew and the tappers. I am looking forward to seeing you in the board room or in The Villa to drink a cup of tea (I will learn to drink coffee) or some beer together!

Gwen van Kessel

Secretary

he 58th board



Bridges

Exactly 21 years ago, on September 1st, 2000, I was born in Sweet Lake City, better known as Zoetermeer. However, my parents quickly changed the city for an oversized town just above the rivers, called Tiel. Since elementary school, I started plWwaying volleyball, which I have always done with much fun and the right amount of fanaticism. When I was little, I wanted to be a doctor, but wisdom comes with the years. After finishing my high school, still in Tiel of course, I surprised my friends and family by choosing a program at a technical university, even though I was known for my two left hands. I completed my first study year while still living with my parents, because I was not sure yet if Industrial Engineering was the best fit for me. However, after getting my P, I absolutely knew I had made the right program choice! Simultaneously, the jitters started to build a new student life in Eindhoven. Eventually, I ended up with a room in one of the biggest and oldest student houses of Eindhoven. I also actively joined the student volleyball association to continue to play and be active after a long day of lectures and joined the Business Trip committee at Industria. I am glad to be the next Educational Officer of Industria and I will continue to ensure the high quality of our program. Moreover, I hope to make all students as enthusiastic about the variety of courses as I am. So, if you have any comments, opinions, or ideas about the courses, good or bad, I will be open to all your suggestions. Just come to the boardroom or say hi with a good cup of tea or drink at the Villa!

Lynette Haksel
Educational Officer

In 2000, a gentleman was born in the beautiful village Dongen in North-Brabant. Probably a somewhat older reader of the SCOPE might think, wow the new Industria board will be managed by a group of 2000 babies. However, at this day, these babies already have 21 years of life experience with them. Personally, the first 18 years of my life a predominantly spent in Dongen. I went to primary school there, played at a football club named vv Dongen and for the secondary school I think you might have guessed it, chose the school in Dongen. However, for my university life I spread my wings and moved to Eindhoven and became an active member of Industria. I immediately felt at home here and liked to do a lot of extracurricular activities during my study period, such as committees like the bartenders committee or the educational councils. Due to these diverse views on all pillars of the association I would like to strive for an amazing new year for all Industrial Engineering students. As the upcoming chairman, I will strive to realize this promises and hope to brainstorm with each one of you to make upcoming year one to never forget! See you in the Villa.

Daan van Strien
Chairman

On the 3rd of August between the apple orchards of Geldermalsen, a small town just 10 kilometers above the rivers, I was born. Since my whole family could pronounce the 'zachte G' while I could not, I decided to cross the rivers after secondary school. In Eindhoven I started the study Industrial Engineering and soon I became an active member at Industria. With much pleasure I joined the F.A.C.U.L.T.I. committee and later also Induska and the Yearbook committee. You may also have spotted me as a bartender behind the bar of The Villa. Upcoming year you will probably not see me behind the bar anymore, but you will see me behind the beautiful glass walls of the Industria board room. Here I will take on the role of the Treasurer. If you ever have questions concerning money the coming year or if you just feel like a coffee or a beer, don't hesitate to approach me. Evie is the name, but others also call me Evert; how that name came about you will find out when you talk to me after I have spent a few days on Stratumseind (if I can still talk back then).

Evie Hendriks
Treasurer

Why I am coming back to the Netherlands to study and why I stopped my major last year.

TEKST Martin Dimchev DESIGN Caitlin Riesewijk

Before I start sharing my experiences regarding Eindhoven with you I would like to tell you curious things about myself so that you could get to know me at least a bit. My name is Martin and I have been born and raised in a medium-sized Bulgarian town. I have been into a variety of fields such as sports (none of which I have been consistent in), Red Cross Movement, even some drama classes but none of them actually appealed to me the way Mathematics and Sciences did. Owing to my parents' interest in travelling I have had the chance to visit many a place all around the world. This broadened my horizon and as though from a very young age I caught myself considering the chance of earning my university degree abroad.

In all honesty TUI/Eindhoven was not my first choice. However, due to the guidance of my English teacher, I left myself with only a few universities to pick from all of them based in Netherlands. Despite it taking loads of time I did the research myself on the cities, facilities and programmes until I was completely sure that this was the place for me. I applied for an enrollment and after getting accepted in the beginning of 2020 things started to change.

The coronavirus pandemic was announced around February- March of 2020 and since then I started wondering how that would affect the way that teaching would be done. Judging by my high school teaching was not really sufficient and both teachers and students alike found it hard to transfer to classes online. But what distracted me from that fact was my departure for Eindhoven in a few months which I was really



"Enjoying one amazing sunset, while finishing up university work by myself in Atlas."

excited about. All I could think of was that new challenge ahead of me.

I was looking forward to the beginning of the school year, despite the fact that I knew most of the lectures will be pre-recorded and meetings will be online. Once I arrived in Eindhoven I settled down in my little accommodation and went about exploring the city. The Parties hosted by Industria gave me the chance to meet many new and exciting people including the board of Industria themselves. They gave me advice and guidance on the life at TU/e in general which really helped me start out my school year. Unfortunately about a month later all parties were stopped because of restrictions regarding the pandemic. From that point on everything became quite different. The parties and the meetings with friends on campus became completely forbidden. I spent most of my time at home on the laptop in my studio. My focus, determination and energy began slowly declining. I liked the courses we were taught but I found myself getting overwhelmed by the amount of time we had to spend daily in front of our laptops. Furthermore, having the exams online is also quite uncomfortable for me, I guess I just had not gotten that used to it yet. During the holiday season I came back to my hometown to spend the holidays.

Since the pandemic restrictions were getting worse I stayed home for quite longer than expected. Slowly in time I realized that I could not adapt well enough to both the new way of studying in a university and doing it online as well. There was some hesitation but after one or two meetings with my study advisor I decided that it was best for me to quit before the BSA norm deadline and repeat the year later in order to be able to have a different, more immersive experience as a student. After finalizing my documents I spent the few months off with my girlfriend, friends and family. It was a wonderful time, but I was also little anxious about the restart of the study.

Now that I have had a taste of how this year is kicking-off I can confidently say that the social environment is completely different from what I was used to seeing in Eindhoven. The spirit of the students roaming all around campus all day, busy people filling up the bike lanes, each on their own way, that is something that can not be described via words nor could it be experienced like that online.

In conclusion I can say that I hope that The Pandemic will slowly go away and student life will return to normal very soon. And regarding anyone reading who has doubted whether or not The Netherlands is a good destination for their degree- I can only say that there is a reason

that I am coming back to the same country, the same city, doing the same major- it's a captivating country with interesting people, infinite possibilities for fun and the best place for people brave enough to face the struggle of leaving their comfort zone and opening themselves for a completely new and splendid student life here in Eindhoven.



"My friend and I on our way exploring the other side of Eindhoven"

Alumni speaking

In 'Alumni speaking', each SCOPE two members of alumnia association Alumnia are interviewed. They talk about their careers, current activities and the relationship with their studies.

TEXT Rutger Bruin & Kees Zwaan DESIGN Caitlin Riesewijk

Rutger Bruin

What has your career been like so far?

My career so far consists of roughly 3 phases: After completing my studies, I worked as an employee for 12 years. I joined IBM as a trainee and then as a member of a large accounts sales team that sold mainframe computers to Shell and Akzo. Later I worked at Pink Elephant as a business unit manager in IT services. After that I worked at Randstad for 2 years as a Regional Manager.

At the end of 1999 I moved with my wife and 2 young kids to Curaçao, where we lived for 13 years. I had a wonderful time there both as a business owner and also in personal life. In the Netherlands I was swallowed up too much by my work and I was sometimes too late at the daycare to pick up the kids. In Curaçao I got a much better balance between family and work, I enjoyed both family life and my work as an entrepreneur. I first set up Wereldstage, an agency for internship mediation, together with a partner. Subsequently also an off-shore telemarketing agency (The Talent Factory) and recruitment agency (The Research Factory), both in collaboration with partners in NL. All 3 small companies where we worked with great pleasure and also managed to achieve some success.

Because of the future of the children, I returned to the Netherlands in 2012 and since that time with Blue Ocean Recruitment I have been focusing on services in the field of executive search and career coaching.

What makes you happy in your work?

As a head-hunter, I guide people with the next step in their careers. On the other hand, I help my clients to build successful teams. That role suits me very well and gives me a lot of satisfaction. As a career coach, it goes a little deeper. I challenge my clients to make better choices with new insights, which makes them more successful with much more pleasure. This not only has an effect on him/her self, but also on the relationships around that person. That gives me a lot of satisfaction.

What was the most important moment in your career and why?

I'd like to highlight two really important moments. The first was in 1984 during my studies, when my father died suddenly just before his retirement. Always worked very hard and made a career. That had a huge impact on me at that moment and had a lot of influence on my career choices later on. The second moment was in 1999 when I handed in my badge and lease car at Randstad and started for myself. That was really a defining moment. I remember standing at the metro station in Diemen, full of energy and feeling that a new period had arrived.

What does your work/life balance look like right now, and are you happy with that?

Since I started working for myself, I am actually always satisfied with the balance between work and private life. On the one hand because I have a lot of fun during my

work and I have the freedom to organize my work myself. And also, because there is always room to improve my work, try new things and work together with like-minded people.

As an Industrial Engineering manager, how do you distinguish yourself from managers with a different background? In which aspect is the greatest added value as an Industrial Engineer?

I have always benefited from my technical business background. A study with which you build up insight into all relevant aspects of an organization, in mutual connection, is still quite unique. As an entrepreneur, this is of course essential, but also in conversations with clients that helps me enormously.

Old question: As an Industrial Engineering manager, how do you distinguish yourself from managers with a different background? In which aspect is the greatest added value as an Industrial Engineer?

New question: What knowledge/skills of your studies have proven to be the most valuable for your career? And in hindsight, what knowledge and skills would you have liked to gain during your studies?

Why: I am curious how my fellow students used their technical business background and also what they would have liked to have learned in hindsight during their studies.



Rutger Bruin

Age: 59

Graduation year: 1988

Role: Executive Search Specialist

Company: Blue Ocean Recruitment BV



Hubert Deitmers

SCOPE 4, 2021

Owner of Endeit Capital



Geert-Jan Vogels

SCOPE 2, 2021

Board of directors of Tectum Group

Kees Zwaan

What has your career been like so far?

After graduating, I started working at Makro in the Supply Chain department, a wholesaler with a very diverse product range. That also makes the supply chain very interesting and I have been able to fulfill various roles and projects there. For example, moving our warehouse to a new logistics service provider and implementing the planning tool Slim4 (Slimstock). Currently I lead the planning team where we centrally manage the availability and stock of both our warehouses, our stores and webshop.

Looking back on your career with today's knowledge, where would you have made another choice?

Honestly, nowhere. Makro has been the best choice for me as an employer, I could not have imagined a more instructive start and the organization fits well with me as a person. Big and dynamic enough that there are all kinds of initiatives and projects running and small enough so that you quickly have a broad responsibility.

Is there a step in your career that has been decisive and if so which one?

I am thinking of two things. The choice to follow my master's in Eindhoven has taught me to think in a structured way. After my studies I started at Makro and gained a lot of experience there. I have been lucky enough to be able to develop myself broadly within Supply Chain and have gained the possibilities and the confidence to do that, I am grateful for that.

An Industrial Engineering expert often knows how to look closely at the bigger picture. Suppose you can trade for a week with Mark Rutte and the Netherlands is your BV, which 2 things would you find important and tackle?

Nice question! The first thing that comes to mind is the Corona vaccination program. To seek (and follow up) more advice from the logistics experts. For the climate issue,

I think it would be good if we invested more in science research and technical innovations. In doing so, assess the total life cycle and duration of solutions. As a small country, we can make a global contribution to this and position ourselves economically in a favourable position.

But oh well, the best pilots are ashore.

What advice would you like to give current students?

Think initially of the industry in which you want to work, only then at which company. Especially if you want to specialize, the choice of an industry often determines the further course of your career. Furthermore, you naturally want to have fun in what you do and you want to learn something there. Finally, make a contribution for the company, even if you may want something different at that moment. Put the interest of the company first and then your own interest and career. Your reward will follow automatically.

Old question: Looking back on your career with today's knowledge, where would you have made a different choice?

New question: Why did you choose the industry in which you now work?

Why: The old question is very similar to the one that comes after it. I find it interesting to read why someone chooses a certain industry and what the characteristics of that industry are.



Kees Zwaan

Age: 30

Graduation year: 2015

Role: Manager Replenishment

Company: Makro



Luke van de Bunt

SCOPE 4, 2021

Manager Network
Management at Den
Hartogh Logistics



Thomas Wijnberg

SCOPE 2, 2021

Business Analyst at
Alliance Healthcare

Alumnia Board Update

With the 'Summer of Love' (or not) already behind us, we as Alumnia look back on a great summer. In the form of an online trilogy of keynotes, some of the challenges posed by the crisis and how to tackle them were explained by professionals from the supply chain, healthcare and education sectors:

In the first keynote, alumni Jan Fransoo (Professor at Tilburg University and TU/e) and Paul Enders (ASML and TU/e alumnus) elaborated on how they organized themselves in cooperation with other TU/e alumni to contribute to the vaccination strategy. They also answered the following questions: What distinguished their 'support proposal' from other support offers, what were the most important sub projects, what were the results of these projects and what remain the biggest unsolved problems?

During the second keynote, Marcel de Jong elaborated on the advisory role he had towards politicians and what his contribution had been in setting up the Landelijk Coördinatiecentrum Patiënten Spreiding (LCPS). The aim of the LCPS is not only to create insights in the current situation in Dutch hospitals, but also to investigate the expectations, prognoses and scenarios that prepare The Netherlands for the future.

Fortunately, in between all digital events, there have also been already some

events that have taken place physically: For the first time in eighteen months a graduation ceremony was held again. Not as we are used to in a big hall with drinks afterwards, but as a walk-through in Atlas (formerly the Main Building). We were not used to this new format, but it did give us the opportunity to have personal contact with the new alumni and their family members.

As Alumnia Board, we are looking forward to getting together physically again. We will therefore keep a close eye on the government guidelines and as soon as we can, we will hopefully be able to organize the networking drink at a nice location again.

As always: keep an eye on your mailbox and website and see you soon!



Martijn van Aspert

Chairman Alumnia



Sustainable supply chains

Currently sustainability is a hot topic in all industries. However, the beauty of supply chain management is the combination of companies that need to strive for that goal. Therefore, real in-depth supply chain planning will not only lead to cost reduction but also to significant globally responsible behavior. Most recently the IPCC released a new climate report which will disastrously impact nature. With extreme weather conditions rising in regions even very close to Eindhoven such as the Limburg province dealing with harsh weather conditions. As large companies greatly impact the CO2 consumption smart supply chain solutions could minimize the impact to a desirable level.

However, each reader is impactful for these supply chains by any means. For example, sorting beer bottles when handing in your beer crate reduces the loss of glass bottles by a large amount. Furthermore, food waste impacts overproduction along the supply chain providing an increasingly large problem due to the bullwhip effect. Moreover, when distributing your waste, making a mistake requires new sorting after new sorting after new sorting. Therefore, if consumers think one step further about the impact of their actions a desirable new way of living could arise. Thus, I want to ask the following question: "Will you be the start of the solution or remain the problem?"

Daan van Strien

Chairman Industria



FOTO De Leeuw Media

Your drink's journey



FOTO JDe Leeuw Media

Recently, the Dutch government had announced some relaxation of the Covid-19 regulations, which were mostly applicable for educational activities. I think this is a great prospect for the upcoming year. Especially, because this means that our beautiful campus will once again be more filled with students! Another great advantage is that we may have soon the Thursday drinks like it used to be. And while our journey to The Villa is only a few stairs in Atlas, the drinks in your hand have come a long way through different stations.

As an Industrial Engineering student, the connection between the stages of a supply chain is a well-known example used in courses: "How can we optimize the throughput times?" or "What is the minimum and maximum level needed as inventory?".

These questions have to be monitored continuously during the whole journey. For example, your well-deserved beer on Thursdays starts as a small grain and evolves through mashing, lautering, boiling, fermenting, conditioning and finally packaging in the drink we know. But the endpoint of the drink in your hand is not even you. The journey of the packaging continues to the final stage of recycling. And the journey can start all over again... I think this example illustrates quite well that there is more to every product you use. And maybe, who knows, as a future Industrial Engineer, you might be able to radically change a supply chain with new and bright ideas you thought of during a Thursday drink!

Lynette Haksel

Educational Officer



23 November 2021

Crossing Borders

Knowledge sharing within organizations, between companies, and across nations



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