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Dear reader,

In the past month, the relaxation of the corona rules was one of the main topics in the news. I think we are all happy that we can see each other in real life instead of via Teams. For me, as a board member of Industria, this means that we can arrange almost all activities without restrictions. Of course, this is much better compared to last November’s total lockdown. Like many things in life, my board year proceeds with peaks and valleys. For now, it is important to look at the bright future, which is also the theme of this edition.

This edition contains various articles about the theme ‘Into the Future’. Lars Geerlings interviewed Lonneke Makhija about the founding of Finaps, Maiky Geerman spoke with Atos about the future of knowledge workers and Sander Roeleven talks about the innovations and future plans of ProRail. Moreover, Bob van Ginkel interviewed Rijkswaterstaat about the mobility model for the future and Vita Broeken talks about the potential futures at Prodrive.

Next to this, Nick de Jong talks about his exchange semester in Copenhagen and Jorg Schoenmakers about his extra-curricular activities. Stefano Dimastrapasqua talks about the future of 3D printing and Bauke Wijnands writes about preparing the future without a crystal ball. Columns of Kenneth Braakman, Daan van Strien and Lynette Haksel, the Alumnia update and Alumnia speaking can be found on the last pages.

To keep the tradition going, I will end with a poem:

“Building your future
With each chance you take
Living the dream
From which you cannot wake” - Ms Moem

Enjoy reading this edition of the SCOPE,

Caitlin Riesewijk
Chief editor SCOPE
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Already more than ten years ago, Lonneke Makhija, resigned from her job at a well-known Dutch Bank, after being a banker her whole working career. But she did not resign for a bad reason: she had a vision and she, together with her business partner, wanted to bring this vision into reality. This is where Finaps originated. The company started from an idea from two individuals but has since developed into a business with over fifty employees! And they are not thinking about slowing down, in a few years this could be double the size. But what was their vision 12 years ago? And how does it align with their current vision? SCOPE conversates about the developments Finaps have made since, together with founder and managing partner Lonneke Makhija.

The founding of Finaps

“By chance, I transferred to the IT side of banking”, says Lonneke during our conversation. Hence, chance has led to the start of a successful Dutch company. This Dutch company is called Finaps, which focuses on software development. Their name shows signs of their origin: Financial applications. Although many years, with significant additions and changes to the company, have passed since, the core of Finaps remains finance, but even more: applications. The first question in our conversation is about what Finaps does, the first thing that sprouts to Lonneke’s mind: “We are a software company”. Hence, the “APS” part is certainly still there! But what about Finance?

Lonneke started the company with a vast amount of knowledge about banking and finance, therefore it seemed natural to take that as a starting point. Her business partner had experience with the low-code platform Mendix, another Dutch company that had only started a few years earlier by then. So it seemed only natural to merge the knowledge and develop financial applications based on Mendix. Currently, the company has expanded to various industries such as healthcare, government and other service industries, Lonneke tells me. But they have also expanded to other techniques besides Mendix. But is their core still there? And how did Finaps grow to what they are today? But also, what do Lonneke her goals entail for Finaps and herself?
It all started at... the kitchen table

To answer these interesting questions, we first will have to go back in time. In 2010, Lonneke acknowledged the problems banks were facing. During her time as a banker, plans had to be made years upfront. By the time the plans had finally been implemented, it was already lagging behind the innovations. That is when she started to think about better ways to deliver and implement software solutions for the Financial Services sector. At the kitchen table, they founded the company. “We did not want any investors. We were able to do so because we provided a service, which meant we could bootstrap the cost and we mainly had to invest time. But it also meant that there was no income at all. We set a target to find our first customer in one year time, that understood our proposition and was willing to pay for this.” And they succeeded! Quickly after finding their first client, they hired their first personnel. This was the starting point of expansion. In the first two to three years, the sole activity of Finaps remained to build applications for the banking world with Mendix. But hiring people meant an expansion of knowledge. Hence, the organisation grew, building upon new experiences. Their growth did not stay unnoticed. After a while, other industries using Mendix came to Finaps for their services. With their newly gathered knowledge, it was possible to move into these industries. But especially in the beginning years, Finaps had to stay true to their core and not take anything that came along their path, Lonneke said. The strategy stayed the same. Although new technologies have been adopted by the company, and they have expanded towards public services, healthcare, NGOs and logistics, the financial services industry remained their sweet spot. But did Finaps have an advantage over their competitors and even banks? “Banks had many individuals working on similar projects. But when designing an application in such a traditional IT environment, information was spread out over many people. You had developers, business analysts, project managers, software engineers and architects, resulting that a lot of the information was lost in the process. Developers had little contact with the end-customer, and solutions were not in line with the business. We have been able to store this process into one: our developers talk with the clients directly. The engineers take ownership of the whole chain and therefore their responsibilities are much broader then only development. They consult, translate the information into design and also actually build the solution as a team. In the process, we discuss our progress every 2 to 3 weeks with our client.” Thus, Lonneke explains. This way change at their clients becomes natural, instead of a big bang. This proved to be a successful concept.

Problems along their way

Finaps has since developed into a company with many employees and many clients. But did everything go so smoothly as this story tells? "In the beginning, everyone has an opinion.
Especially before you’ve had success. There are many temptations, companies outside of your core knowledge and abilities which ask for your service. But if you go into these offers, you will not know anymore who you are. You have to keep believing in your proposition, ignore these temptations and stay focused.”

This seems straightforward, but doing it is not as easy as it seems. When asking for what Lonneke was afraid of in the beginning, she tells us: “You are always afraid of things about which you have little knowledge. I was not afraid of the financial and sales parts, but hiring people, especially finding the right people, seemed like a big deal. I put a lot of effort into it, therefore it eventually was not as difficult as expected. And as we had overcome this fear, another came: we had to scale up. Up to 10 people, it is quite easy, but the step from 10 to 25 was very complex, it is the dead valley. We made the mistake to stop at 10, we did not hire anyone for a year. The vertical integration in your company loses power if you do so.” This mistake was in 2013, and she has learned never to stop growing if you are still in the growth phase, thus she tells us.

When asking what she is most proud of in the development of her own company, she specifically picks something related to those problems: the people. Of course, she is proud of the company and what they have achieved. But even more is she proud of the people inside of the company as well as those on the outside: her clients. Together with all her employees, the clients have given Finaps the faith and belief to achieve their goals. “It is amazing to see that the company is so strong, that even when you as an individual are not there it still runs. The culture has grown so strong, that everyone understands. It has become independent!”

Into the future
Lonneke is proud of what Finaps has become. But what will their future entail? The vision has not changed, Finaps will keep building software solutions. However, they will certainly keep expanding their techniques. One of the domains that seem promising is the data analytics domain. Finaps already implements this in some of its applications. They are also currently developing a recurring revenue model. Instead of creating software specifically for a client, this would mean creating and licensing software to multiple possible clients (Software as a Service).

Four years ago, Finaps started their labs’ environment. In this environment, they experiment with new technologies. The clients that want these technologies, know it is experimental. There is a higher probability of setbacks. The lab enables Finaps to look into the future and think about what their role might be in this future. Hence, Finaps never stops developing. Lonneke also tells us that in a couple of years, their employees should be numbered by 100. New people mean new opportunities, experiences and knowledge. This will enable Finaps to develop new technologies and further enhance their processes. According to Lonneke, but also to Mendix itself, they a very high quality service provider in the area of Mendix, but they will build from this further into the future!

Lonneke Makhija

Lonneke Makhija started her career in banking after completing her Master’s degree in Economics. She has worked for over 10 years within the financial services industry in various roles, starting as a banker within commercial lending to becoming a Global Program Manager at ABN AMRO International. In 2010 the Financial Services Industry had changed drastically and she believed there was room for new opportunities within the dramatic changes that we were seeing. This resulted in the start-up of Finaps in 2010. As founder and managing partner she is involved in setting out Finaps strategy and identifying new opportunities. “At Finaps we like to get things done. Of course, there are challenges every day as in most of companies but all of us will work hard to overcome them together. If we succeed, we celebrate and if we fail, we step back and look at the reasons and start again.”, thus Lonneke says.
Changing the world
one nanometer at a time

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Work, besides sleeping, is the thing we spend the absolutely the most time on. The average person spends about 30% of their life working. Therefore many people, and probably you as well, find wellbeing at work increasingly important. We want to spend the major part of our lives at work well, working on things that we love, that challenge us, that are relevant. Yet, for a long time in our history, work used to be something that we just needed to do to survive. Today, we have a plethora of tools that can assist us in making our work easier, more enjoyable, and more productive. Work has changed a lot already, but we cannot help but wonder how it will be in the future. Will we continue to work more from home, or will the office make a resurgence? Or will we even work in the metaverse in the future? And what about our work itself? We spoke with Marianne Hewlett from Atos to evaluate what the future will hold for us, knowledge workers.

TEXT Maiky Geerman DESIGN Caitlin Riesewijk

While we’re nowhere near a utopian work environment yet, the last couple of years showed a major shift in the way we work. The pandemic has forced many companies to continue their business online, causing lots of online business tools to pop up. From well-known applications such as Microsoft Teams and Zoom, we’ve seen many of them throughout the pandemic.

The new standard
Although a majority of workers would be glad to return to the office and meet up with their colleagues again, only about 10% of workers state they would go to the office for individual work. Due to the increasing convenience of online working, the majority of people seem to realize you can easily work from anywhere, anytime. Therefore, the office seems to be shifting to a place to meet and collaborate rather than to do individual work.

Online tools can provide great benefits, such as reduced travel times and increased knowledge availability. Marianne: “Productivity remains steady - we don’t see the steep drop that some “old school” managers have been predicting for years - yet, we also
don’t see an increase in productivity either.” A report from The Economist also showed that people work longer hours when working from home, but aren’t necessarily more productive. As commuting time transforms into extra working hours, we may work longer but the productivity level per hour decreases. Furthermore, the barrier between private life and work seems to vanish and organizations need to step up their mental wellbeing programs and address early warning signs of burnout.

Marianne Hewlett, among other things, explores the Future of Work and the impact of technology on individuals, organizations, and society at Atos. Marianne: “Humans are social beings. We miss the physical contacts, the small talk, and the moments at the coffee machine. That’s one of the reasons only a few companies decided to close all their offices.” Most companies seek to find the right balance between the physical and online workplace according to Marianne, and the office should remain available to facilitate physical meetings.

Despite the absence of social contact, remote working will likely be done a lot more after the pandemic. And this affects not only the way the office, but also how our workplace at home will look.

**Changes in our work environment**

The shift to hybrid work will definitely be noticed in the office design. As the office is more and more evolving in a place to meet – a clubhouse - an open office design is becoming more prevalent. Individual workspaces tend to be transformed into meeting and collaboration spaces, which will also facilitate hybrid working. The key is to ensure the workplace is inclusive, and all employees who join the meeting online or in the office should feel they have equal time to speak, join the discussions and feel “connected”. To enable this, we will see more smart technology entering the office, from cameras detecting who speaks to more futuristic virtual and augmented reality tools. Whilst hybrid working will require offices to be repurposed creating more space for team meetings and collaboration, brainstorming, and socializing spaces, most organizations will be able to save in total. Marianne: “Every employer has a duty of care to ensure employees can work safely and productively, not only in the office but also at home. Sometimes I hear that hybrid working is a way to save on costs by reducing square meters in the office. However, smart organizations invest the money saved into repurposing the office and supporting employees in creating a stimulating and healthy work environment at home. For instance by providing ergonomic desks and chairs, or a personal budget to cover working from home costs.”

And while the reduced travel expenses might be a great benefit for

“Smart organizations invest the money saved into repurposing the office and supporting employees in creating a stimulating and healthy work environment at home.”
companies, it is even greater for the environment and the journey towards net-zero. Marianne: “A couple of years ago, people looked up to you when you traveled a lot for your work. Nowadays, sustainability is a very important topic and it is frowned upon to spend a day traveling just to attend a 2-hour meeting that could have been organized online. Not just from a carbon footprint point of view, but it is also less efficient. Having said that, also here we need to find a balance between meeting in person and online to build and maintain good business relationships.”

AI all-around
In extent to changes of our physical environment, AI will play a big role in the offices of the future as well. Marianne: “The office is increasingly adapting to the needs of employees. We will see a trend towards hyper-personalization in the future”. Where work used to be rather technology-driven, nowadays we more and more see a human-centric approach. In the future, technology will adapt to humans, and not the other way around, Marianne states. “Work will become personal”.

In fact, much data can be and is already being collected to provide personal recommendations to improve productivity and wellbeing. Microsoft Viva Insights for example can collect data such as your collaboration time, your focus, your mail activity, and much more. Nowadays, AI can even tell you by the way you press your keys, whether you are stressed or not. Smart building technology can adapt the environment to suit your mood and needs, for instance through smart lights that can adapt to the task that’s being done, Marianne tells us. More blue light is desirable for intensive tasks, while more relaxing light is preferred at social meetings. Marianne: “We will see much more of these convenient technologies in the future, and it is likely everyone will have a unique work experience, specially made for the employee’s personal needs.”

Challenges of hybrid working
Hybrid work does impose several important points of attention. First and foremost, companies need a safe and secure environment to work in. According to Marianne, cybersecurity is more important than ever and will be even more so in the future. Marianne: “Companies see more and more attempts of phishing and encounter a lot more ransomware for example. And hackers will continue to break into systems and access valuable data.”

But besides the malicious hackers, the new way of work itself also has its implications on its own/itself. Marianne: “As stated before, the main challenge with hybrid working is: How do you keep it inclusive and accessible for everyone?” Often we see there is an “proximity bias. Namely, when you see someone in person more often,
Marianne Hewlett

Marianne Hewlett is a Chief Marketing Officer at Atos Northern-Europe. Additionally, she is a member of the Atos Scientific Community where she explores the Future of Work and the impact of technology on individuals, organizations, and society.

you often discuss more and have a greater chance to get to work on more desired projects.” Therefore, people who are working more from home would then be rather disadvantaged. Companies should and will invest more in the integration between online and physical workers. Marianne already gave us several examples that could enter the office, such as futuristic virtual and augmented reality tools, that will help us with this integration.

And lastly, something we’ve all dealt with somewhere along the course of the last two years: Virtual fatigue. And indeed, the future does look promising for virtual work. AI is becoming more advanced, and our working conditions are becoming better and better. But endless Teams meetings day in, and day out are just not what humans are designed for. We still just cannot match the level of social contact we experience in real life. Although, some companies are trying, and they are doing good work.

Virtual cappuccinos

Several companies have already attempted to answer this lack of social contact in virtual work and have developed tools what we call social tools. One of those new social tools is Mysterycoffee. This tool simulates a typical coffee moment, where you can network with new people. The program uses AI to match you with people based on the company you work for, your interests, or other features such as the color of your eyes. Marianne states that these “serendipitous” moments or chance meetings stimulate innovation and creativity within companies, and it is those moments that are absent now. There is a variety of other social tools that portray a more social setting than traditional meeting applications such as Zoom and Teams. In the future, Marianne expects that social tools like these will become part of our day-to-day business toolkit. And while virtually anything will become possible online, Marianne asks herself: “Do we want it, and where do we draw the line?”.

How ‘meta’ do we go

At last, the Metaverse. A term that has not missed news recently. In principle, everyone can create their own, perfect, online world in the Metaverse. The pinnacle of hyper-personalization, you could say. You can work at your favorite places: at the beach, or maybe on top of a mountain, or even on the moon, it’s all up to you. However, Marianne warns us: “Like all other things, we also need to find a balance in the Metaverse. A pitfall for many people could be that they live and work too much in their own bubble in the Metaverse, neglecting the existence of the real world”. And this real world also comes with negative aspects and emotions, such as pain or sadness. Just as much as with positive aspects, like joy and happiness. It will be interesting to see how companies and people will find this balance between the real world and the Metaverse.

Nevertheless, while the future of working in the Metaverse is getting closer, we need to adapt to hybrid work for now. Many companies are still getting acquainted with all the possible online tools, and employees and employers are trying to find a balance between working at the office or from home. This shift to hybrid work also offers a lot of interesting opportunities for new ventures to create online tools and applications that resolve issues we currently have with online work. Data will become more and more important in the future, and hyper-personalization will grow rapidly in many aspects of life, as well as work. SCOPE and Marianne are definitely excited about what the future of work will hold.
Innovation is an important element for companies to keep existing and do their daily work. The same holds for ProRail as well. SCOPE visited ProRail to talk about its innovations and future plans. What kind of innovations is ProRail involved in? How do innovations affect their own organization? What consequences do these innovations have for ProRail’s collaborations with other parties? SCOPE spoke with Michelle Spaas, program manager of innovation & development.

About ProRail
The Dutch railway network consists of 7,021 kilometers of track, 2,589 level crossings, 4,500 kilometers of overhead wires, 7,071 switches, and 404 stations where 1 million train journeys are made every day and 115,000 tons of goods are transported on a daily basis. ProRail is responsible for the maintenance, renewal, expansion and safety of the Dutch railway network. “As an independent party, we divide the space on 7000 kilometers of track (between carriers), regulate all train traffic (1.4 million journeys per working day) and build and manage stations”. ProRail has been founded in 2005 and its headquarter is located in Utrecht. Subsequently, ProRail has several regional offices located in Amsterdam, Eindhoven, Rotterdam, and Zwolle. More than 4100 employees are currently working at ProRail.

In general, ProRail makes sure that trains can run on the track. Michelle Spaas explained: “Within ProRail, you can distinguish two chains: a logistics chain and an asset chain. The asset chain is focused on optimizing the infrastructure and technique. The logistics chain is more focused on dividing the space over the tracks and regulating all train traffic. Future planning is an important element of this chain. How are we going to use our future infrastructure? The activities in these two chains are different, but of course, they are also connected to each other”.

Department innovation
Michelle Spaas works in the innovation department of ProRail. This department is central within the organization, so it does not belong to a specific business unit. “We work with all departments of ProRail and we connect them in the innovation department. It is complex to introduce new innovations in the rail sector since many people depend on
rail transport. Trains should drive day-in-day-out according to the train table. When something goes wrong, it might have huge consequences in other places. The challenge lies in implementing new technology and workspaces, and still be in full operation daily”. Within the department innovation, a distinction has been made between three clusters. These clusters are known as ‘motor’, ‘services’, and ‘strategy’. Michelle Spaas: “The cluster ‘motor’ is about large innovation projects and technological innovation. It is more focused on transitions. Before the COVID-19 pandemic, the train network was almost overloaded. 30% growth is expected coming period. That is why we want to have more trains running on the train network in the future. Therefore, we are looking for more possibilities on the current infrastructure since building new infrastructure is very expensive”.

This cluster is thus mainly concerned with the substantive part of innovation. “The cluster ‘services’ is mainly involved in supporting innovation processes. What are the bottlenecks in the innovation process? How are we going to solve these bottlenecks? How can I integrate innovation into my own work? How can we work with external innovation partners? The cluster ‘services’ is mainly concerned with these questions. The last cluster, ‘strategy’, is concerned with aligning the agendas. Conversations with the ministry and NS (Nederlandse Spoorwegen), provinces and carriers belong to this cluster. How can we do things together?” Thus, this together forms the innovation department of ProRail.

Into the future

The theme of this edition of the SCOPE is ‘into the future’. ProRail tries to implement innovations in various ways as well. “Currently, we are working on finding ways to increase the capacity of the train network in order to be able to keep up with the demand in the future”. Besides increasing the capacity of the train network, security is an important element where ProRail wants to innovate as well. Michelle Spaas explained: “A new security system (ERTMS) is being rolled out at the moment. This is an European standard and it does lay a good foundation for other innovations. Think of automatic driving of trains. Subsequently, we are focusing on the digitalization of our own organization. We want to optimize our own business processes more and more”.

Sustainability is a hot topic at this moment where everyone has to deal with. ProRail wants to make the ‘use of materials’ more sustainable. For example, the lifespan of retaining walls and sound walls can be made more sustainable. Subsequently, ProRail has another goal when it comes to sustainability. “Our goal is to replace short-haul air traffic. So, all flights within a range of 1000 kilometers or less. This mainly involves collaboration and innovation with European rail partners”. This shows that ProRail
innovates on different aspects and that they do not only focus on innovation in The Netherlands, but also in collaboration with other countries. Consequently, these innovations require adaptations of the organization as well.

**Organization**
Each organization has to adapt and improve continuously in this rapid-changing world. Work that an employee executes, changes too. “As an organization, we also change, but we do not change our organizational structure every year. We work on topics we want to improve. At this moment, we work on connecting the two chains (logistics and asset)”. Furthermore, taking responsibility is an important element in the organization of ProRail. Michelle Spaas explained: “We emphasize taking more responsibilities together. It is not only taking your own responsibility and staying within your own frameworks, but really collaborate and see how we can improve the end result. You must be aware of what your responsibilities entail and what this means for the next person in the chain. In this way, we together achieve more optimal results”.

**Collaboration with NS**
ProRail and NS collaborate intensively on different aspects, also in the field of innovation. For example, ProRail and NS have become members of a European program. Michelle Spaas explained: “From the beginning of this year, ProRail and NS have jointly become core members of the European research program ‘Europe’s Rail Joint Undertaking’ (EU Rail). This program should help to accelerate collaboration and R&D innovations, and it should help to better connect different European rail systems, to facilitate rail capacity growth after 2030 and to make transport via rail cheaper and more attractive”. Back in the day, each country had its own infrastructure. It was very difficult to cross the borders by train. This shows that ProRail and NS closely collaborate. “Sure, we are two separate companies each with its different interests, but that does not stand in the way of good cooperation and partnership”.

Besides the close partnership between ProRail and NS, ProRail does also have good partnerships with smaller (regional) train carriers in The Netherlands and local authorities. Michelle Spaas: “With these parties, we are developing in the field of energy transition, as approximately 15% of the trains still run on diesel, mostly on regional lines. For example, we are looking at whether these trains can run on hydrogen or batteries”. Therefore, ProRail also works closely with other parties in the field of innovation.

**Future of ProRail**
Innovation will always be important for a company to keep existing and growing. How does Michelle Spaas see the future of ProRail? “We are already making big steps in the field of digitalization. We will continue with this. There is also a great opportunity to make railways even more efficient with even more options. In addition, the implementation of the security system helps to make leaps in technology, which will provide great opportunities in the future. Of course, in the innovation department, you see many opportunities where improvements can be made. The trick is to implement it together with all operational departments in such a way that passengers and freight transporters are not inconvenienced by it. A great challenge to work on!”

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**Michelle Spaas**
Michelle Spaas is programme manager at the department of Innovation & New technological of ProRail. She studied Industrial Design Engineering at TU Delft and has been working with ProRail for 25 years. In very different positions, but always in the field of innovation. Her focus is now on building partnerships between ProRail and external knowledge partners. “I make the match between the goals and ambitions of ProRail and knowledge of universities, industry, start-ups, etc. I get to explore new possibilities and meet enthusiastic and driven people to work on rail-issues”.

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**ProRail / Stefan Verkerk**
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Predicting future mobility at RWS

Rijkswaterstaat is the agency responsible for road and waterway networks, water systems and its’ environment. Besides the visible work Rijkswaterstaat is doing at the highways, they do much more. For example, making sure the Netherlands does not flood or ensuring a smooth and safe flow of traffic. Rijkswaterstaat has a team working on a mobility model to support future mobility decisions to be made by the Dutch Ministry of Infrastructure and Water Management (Infrastructuur en Waterstaat).

One cannot just build a road to see how this will change the intensity and travelling of people. The model provides an answer to questions that are not easily answered in real-life. In addition, new roads or railways are not quickly built; these projects often are long(er)-term construction projects. And when construction is finished, the newly build road, railway or infrastructure should still be relevant and of use. Therefore, the model predicts how the future of mobility in the Netherlands will look like over 10 to 30 years. To ensure improvements and that the right improvement can be made well in advance.

Decision-making
Rijkswaterstaat is mostly in charge of building and updating the model and advising the Ministry. Where the Ministry is in the lead of what to do with the outcome. The decision to be made is much more than interpreting the outcome of the model. Politically loaded arguments impact the decision too. Think of arguments such as fairness, providing a boost to a region or general development of the economy. In the end, the Ministry will need to make the political consideration of which measure to take or infrastructural improvements to make.

The model also comes into play when different future actions or measures are considered, by providing a comparison of the alternatives and the effects each measure has. Before adjustments are made a study will be conducted to identify the effects. Think of what will be the largest issues, benefits and which measures could be taken.

Predicting
For predicting this, the model first tries to represent the current system. Many different sources are used for this, ranging from traffic counting systems.
build in the roads, to CBS data (Central Bureau for Statistics) and anonymized personal statistics. From there on, one could assess the model for the current system and how well the model predicts the current situation. If the current situation is adequately modelled, one could add another layer to the model. For example, by including the future expected development of the Dutch economy, employment and population to the model. But also, in advance planned improvements of the Dutch road network and public transport system are considered. One can imagine that more residential or industrial areas influence the route, type and amount of traffic.

**Model itself**

There is one overarching model for the whole of the Netherlands (Landelijk Model Systeem), containing car, truck, train, metro, tram, bike and walking traffic. In addition to the overarching model are four regional models allowing for more detailed modelling (“Nederlands Regionaal Model”). Both models are based on decision models, what if’s, where the assumption is that travellers would like to maximize utility with a mode of transport, i.e. with the least amount of ’travel costs’ or resistance. Actual decisions and data are used to adjust the model and estimate parameters, i.e. the attractiveness of a car vs. public transport or bike. However, predicting the future contains uncertainty, therefore, two scenarios, ’paths’, are made based on the scenarios of the Public Assessment Agency (PBL): a high development path, e.g. less strong development. From there the choice can be made by the Dutch Ministry what the societal utility will be for both scenarios.

Furthermore, modelling not only allows to find effects of decisions, but it also enables uncertainty explorations and what-if analysis to explore questions as what if more people starting to work from home and/or are leaving the cities (suburbanization). Other uses of the model are the prediction of future emissions or noise production and providing input for consultants, researchers and universities.

In short, predicting the need for future infrastructure improvements is not easy, but the mobility model of Rijkswaterstaat is of great help for decision makers. In Rijswijk, a team of eighteen people is engaged in model development to support decision making for building and maintaining a well-functioning mobility system, now and in the future.

**John Spruijt**

After completing his Bachelor Technology, Policy and Management (Technische Bestuurskunde) at the Delft University of Technology, John continued with the Master Transport, Infrastructure and Logistics at the TU Delft. Right after graduating, John started in a traineeship at Rijkswaterstaat. Having seen three departments there, he is currently Traffic and Transport Models Advisor for already four years.

John likes the diversity of his role. Having both the technical mathematic side, software part and knowledge part (human psychology, decision making, economic development) and the collaborative part with knowledge institutes, universities and the Ministry makes it an interesting job.
Have you ever wished you could look into the future? Because now we are going to show you a potential glimpse of what your future could look like. We took on the role as fortune tellers and talked to three different people that now work at Prodrive Technologies, but were students in our department before. Maybe it is in the cards where your future could be heading?

**Jorg van Heesch**

The first card of the fortune teller is represented by Jorg van Heesch. He is a data engineer (or translator, depends on who you ask) and almost graduated 2 years ago from MSE. He started with a focus on quality and reliability, and now focuses on various topics. He explains: “I am not the best at coding, but my strength lies with implementing, communicating the right information and taking people along in the process. Not only is this my strength, but I am passionate about it, and that’s important.”

In his daily work he works on interpreting, communicating and analyzing data to improve many different aspects of the organization. With his team they collect data and translate it to a report that can be used by the many different departments and teams within Prodrive. This helps the organization to become more data-driven, and there will be less “gebeun” in Excel. He discusses with people, especially on the production floor, what their struggles are related to analytics (e.g. machine performance), and helps them solve these issues.

Jorg explains that he still uses many of his skills and topics learned during his studies, especially the way of approaching problems. But looking back, he realizes that he should have taken more human performance and organizational change courses. As he mentioned, changing a process is one things, but communicating to and convincing stakeholders is more important. Furthermore, he believes that all the programming and business analytics courses are very useful.

When he tells us about his favorite memory, he apologizes “That’s difficult, because I started during covid”. However, he mentions a story about one of his favorite moments with his colleagues, “together with a couple of colleagues we went cycling after work. We went for a 70km ride, and after that ride Bram Linders manages to ride a KOM, just before I could”. For the non-cyclist among us, this is short for King of the Mountain, and is something you get when you ride a certain segment at the fastest pace. Jorg tells us how this moment felt great, that even though he was hungry, and it was late, they still aim for the best.

He advises students to find a job that you like and are enthusiastic about. You should care for your work and be able to perform it for 40 hours a week, and 45 weeks a year. Try to figure this out during your studies, do internships, try different jobs, and enjoy your studies!
Ruud de Vries

If we continue looking in the cards, we can find a second potential future. The future that is represented by Ruud de Vries. Ruud has been working at Prodrive since the company had about 40 employees. After his Bachelor Electronics he started working at Prodrive, and soon took on the role as HR manager. He worked this job while finalizing his master in Industrial Engineering with a focus on Human Performance Management.

During his study he learned how to set up an organization and organizes parts that helps employees feel and perform their best. He learned how to understand organizations and have an understanding of what specific functions within the organization do. Additionally, there is a need to keep changing and growing, and take the people along in the change processes.

In his current function he is HR manager of a part of the development organization, especially electrical and mechanical engineers. In his day-to-day work he makes sure the many international employees of Prodrive are happy and healthy. There organization is much bigger, which requires a lot of anticipation and planning.

Ruud could not pick one favorite memory, but tells us that it is great that the work never becomes boring. He has been able to keep developing and try different aspects of the organization. He is very proud that the organization keeps challenging the employees and supports them to keep growing. On top of that, he tells us a story about the canteens. In the old days (says the not-so-old Ruud) there used to be canteen duty, where employees would cook for the entire staff. “This is not possible anymore of course”, he tells us, “But we still manage to keep that team spirit, where we go to lunch and eat together in our free canteens.”

And finally, he provides us and you with some advice. He tells us that we can do much more than we think, to trust yourself with higher responsibility jobs or careers during your study, and that there are companies that will support you with this. He tells us that his time working as HR manager and studying was a great period of learning and growth.

Bram Linders

Our third card in the endless deck of potential futures is presented by Bram Linders. He is Director Planning and has finished his master in Operations Management and Logistics and Business Information Systems. During his master he started working at Prodrive as Supply Chain Engineer, and did his master thesis within the Planning department. Now he has been working full-time at Prodrive for 2.5 years, and through various roles he became the Planning Director.

In this role he is responsible for the demand and production planning department, and makes sure global capacity plans are in place to match future customers growth plans. This requires problem-solving skills and for him to do detailed analysis and create high-level decisions and results, something he learned during his studies. Within his department there are three roles, Demand Planner, Production Planner, and Shopfloor Planner. With his team he manages the planning within the manufacturing department of the organization.

His favorite memory is a bit darker, but has a great message. In December 2018 there was a huge fire at Prodrive, which burned down many of their inventory, as well as their offices. The aftermath is what Linders tells us about. “We all worked together on our recover plan”, he is clearly very proud of what they have achieved, “it taught me that if we put our bright minds together, we can tackle big challenges and achieve great things”.

And on a final note, his advice is to make decisions in your career that help you keep going to your goal. Sometimes this is in a straight line, but otherwise there is always a detour available. Keep motivated and excited for what you do.

After these three fun potential futures, we need to go back and keep it a bit vaguer (as a true fortune teller does), so our final card would say that in the future you will find what you were looking for in a career.

Prodrive Technologies

Prodrive Technologies is a technology company that not only manufactures technologies, but also designs, handles and supports technology. They operate in various markets, such as the medical or the energy market. To create a better future for all of us, they aim to reduce their operational environmental footprint by 50% and aim that at least 90% of their technologies have a direct positive impact on the environment, or health for all. In short, they create meaningful technologies that make the world work. If you got interested in the careers at Prodrive Technologies, do not hesitate to check their website.
Denmark is one of its earliest forms traces back to king Svend Tveskæg (Sweyn Forkbeard) in the first half of the 10th century. When people think about Denmark, they often still think of these Viking kings of old. My name is Niek and let me tell you how I almost became a Viking myself during my exchange semester in Copenhagen.

From September until December, I had the opportunity to go abroad to the capital of Denmark: Copenhagen. Most of you will know this city as the house of Vikings and perhaps the statue of the little mermaid (which is indeed very very little). However, Copenhagen has much more to bring! I studied at the Danmarks Tekniske Universitet (DTU) in Kongens Lyngby, just outside of Copenhagen.

DTU

DTU is a very open and welcoming university with around 11,000 students and is located on a campus known as Lundtoftesletten. Since the campus mainly consists of low-rise buildings, it stretches really far. Luckily for me, Swapfiets is also active in Copenhagen. The story goes that the previous kings and queens of Denmark didn’t want their view from the nearby hunting lodge ruined by higher buildings, which is why it was forbidden until recently to construct buildings with more than three floors in the area. The campus contains both educational and research buildings, as well as student accommodation. I also lived in one of these dormitories on campus. They strive to have a 50/50 occupation of Danish and international students, which is great for getting to know new people and at the same time meeting experienced students that know their way around campus and the city. I lived together in a house with twelve other people with five different nationalities ranging from bachelors to masters. Together with 20 of such houses we formed the dormitory Hempel Kollegiet. Often, people were hosting parties that you could join, or you could go for drinks with some of your roommates. Besides, the DTU campus exploits six bars that open on Friday. Every bar has a different setting (from playing games to party mode) and the beer is a lot cheaper than in the city. Also, the (sport)clubs from DTU can bring you a lot of fun. It’s a great way to meet new people and maybe learn something new. I joined the Exiles Rugby Team during my semester. They trained two times a week and often had a game on Saturday. As you can imagine, it brought me a lot of bruises. Still, the fun was worth it all. Regularly, an Exiles kangaroo court was
held, in which the team captain (and judge) was always right, no matter the defense. Luckily, he ‘never punished because he wanted to, but because we must learn’. Looking at the amount of Underberg drinks I had, I think I had a lot to learn.

Copenhagen and beyond
Copenhagen is a beautiful city with a lot of historical buildings, new architecture, and amazing restaurants. The city even hosts the most Michelin stars in the world and has the #1 restaurant. A lot of people may know Copenhagen from the colored houses in Nyhavn, which is indeed a beautiful place to visit. However, if your bank account is dear to you, it is better to get your beers somewhere else. One of my favorite places to go to was the Proud Mary Pub, close to the central station and city hall. This very large pub has a beautiful décor and is easy to reach. You can also use the NightPay app, which gives you a 66% discount on drinks till 23:00. The app can be used in a lot of places in Copenhagen. I once heard that all those bars belong to the same person and that he uses the app to drag everyone to his bars. With normal prices being €8 for a 400ml beer, you won’t hear me complaining about that discount. If you are ever in need of an original date: visit Tivoli Garden. Founded in 1843, it is one of the oldest amusement parks of the world. Since it never moved its location, it can be found right in the city center of Copenhagen. During nighttime, thousands of lights give the park a great atmosphere.

You can also use public transport to do some sightseeing in surrounding cities. An hour by train brings you to the city of Roskilde. Roskilde was the capital of Denmark during the Viking age, and the cathedral is still the official royal burial church of the Danish monarchs. You can also find the Viking Museum in the city, which hosts 4 original Viking ships that were found at the bottom of the nearby fjord. During the summer, you can sail a replica Viking ship next to the museum or go to the Roskilde Festival. With more than 100,000 visitors, it is one of the biggest festivals of Europe. Another worthwhile trip is taking the Øresund Bridge to Malmo, Sweden. The idea for such a bridge was first established in 1936. Eventually, the 16km, 82 million kg bridge was finished in 2005.

During November, my roommates and I agreed on a no shave November. I got quite the looks of a real Viking. Nonetheless, I missed some sailing experience apparently. Fortunately, Copenhagen is easily reachable by plane from Eindhoven Airport. I would definitely advice you to go see the city some time!

Jaegersborg Dyrehave
In 1669, Frederik the third decided that the wood of Boveskov became his personal hunting territory. The area of 11 km2 is located just north of Copenhagen and contained a lot of deer. Currently, this beautiful park is open to visitors when the royal family is not present. The hunting lodge previously described is located in this park and is called the Hermitage Hunting Lodge. The lodge was built to host royal banquets during the hunts in Dyrehavn. The king and his guests didn’t want to encounter any waiters during their dinner, which is why the table could be lifted from the kitchen in the basement. Hence the name of the castle: En Ermitage (in solitude).
In the past six months I started the pre master Innovation management. Before that I studied Business Innovation at Avans University of Applied Sciences in ’s-Hertogenbosch. Strangely enough, I did not live in one of the two cities where I study, but I ended up in Tilburg. Raised in Helmond, I’ve been to Eindhoven often enough, so I was looking for a new experience. In Tilburg I live with 9 other people in a student house, which has caused many peculiar evenings. I may be planning to live in Eindhoven after my studies, but of course I don’t want to make any promises.

Eigenaardig

In the academic year 2017 I became the treasurer of the Business Club Eigenaardig. Here I helped set up the Business Club, because we were the first board to start it. In the first year you are very curious about which direction you should take with the business content for students. Students are often very interested in setting up their own business, but don’t know what steps to take in the beginning. We have been able to inspire several students in ’s-Hertogenbosch to start their own business through events at which entrepreneurs came to speak.

FOSST

Treasurership fit me well and that is why I decided to become treasurer of Federation Of Student Sport Tilburg (FOSST) in the academic year 2020. In this year the drama about COVID started, which meant that we had to deal with the measures quickly and be flexible several times so that the students of Tilburg could exercise as much as possible. A great year in which I learned what organizational aspects are involved in supervising 23 student sports associations.

Trials, but still failures

I have always had the ambition to work for myself and have tried this several times. In 2017 I became Co-Founder of VENDR, this was a platform where we tried to generate discounts from wanted products by collecting a large amount of demand. However, developing the platform came with a lot of problems that led us to quit the company in the end. In 2019 I participated with a group in the SDG goals, where we focused on the goal “Life in the water”. We had completed this project so well that we achieved an average of 9.3 for our research. Due to this great success, we continued with the group to develop our prototype of 3D printing coral where we taught novice divers how to handle coral safely without touching them. Unfortunately, the project became too complex and each of the project members had ambitions to continue studying.

PRANLO

From the age of 16 I have been involved in producing self-collection urine test kits, well being employed by a hospital. After doing this with my partner for some time, we came up with the idea that there might be several hospitals/diagnostic centers that could use our help. When I was 18 I registered myself as an entrepreneur and today the company is still growing.

Industria & TSTV Lacoste

In life, most people do not become successful by doing everything alone. With these thoughts, I believe that your network can often help you when you are faced with difficult issues. That is why I have made the choice to be active in various associations. Within Industria I am in the MSc and at Lacoste I am a member of the Lustrum Committee. As a result, I experience challenging projects that make me a better person.

Now that the end of COVID is insight, we can do more exciting things that students want to do and we can happily meet each other physically. Hopefully I’ll see you soon at an Industria event, where I’d like to talk with you about entrepreneurship or just how your weekend was. Do you want to start as an entrepreneur? Then, especially in this time of your life, it’s a matter of doing it, falling down and just getting back up!

Spotlight

Are you or do you know someone who did something remarkable? Does he/she deserves to be in the spotlight? Please mail to pm@industria.tue.nl
A reduction of 72% on inventory levels, average cost savings of 47%, and higher availability of equipment. Based on recent research, these could be the benefits of using a 3D printer for spare part inventories at remote locations. Rob Basten, professor at Eindhoven University of Technology (TU/e) and Jelmar den Boer, Commander of 11 Supplycompany Air Assault of the Royal Netherlands Army (RNLA), talk about their research and findings.

Printing Spare Parts at Remote Locations

Many organizations have sophisticated supply chains, certainly also organizations that operate at remote geographic locations: oceangoing transport, offshore, mining companies, or the military. Due to the absence of supporting infrastructure, transportation is expensive and lead times are high. Therefore, spare part deliveries are generally part of larger, consolidated shipments that occur periodically. Additionally, the often difficult conditions of the remote locations create high uncertainty on, firstly, the demand for spare parts and, secondly, the required spare parts inventories. Consequently, stock-outs of spare parts occur. In most cases, this results in additional shipments before the planned periodical shipment; expediting. Jelmar: “For us, the RNLA, our deployment is our primary focus. If we need a spare part to operate successfully, and we do not have it in inventory, we expedite. This sometimes results in a single flight for just one spare part.” To minimize expediting, the RNLA takes many spare parts on a mission. However, not all spare parts are necessary during the period of the mission. Rob: ‘You do not know beforehand which and how many spare parts will be needed. Therefore, a lot of spare parts are transported to the remote location and a lot are returning unused after the mission. Obviously, this results in a lot of unnecessary transportation and holding costs. It isn’t very sustainable either.’

A potential solution to decrease the total costs of inventories in remote locations is three-dimensional (3D) printing. This rapidly developing technology makes it possible to print spare parts locally. Therefore, expediting and unnecessary holding of inventory could be replaced with raw materials and a 3D printer. To see what the potential benefits of a 3D printer located at remote locations could be, Bram Westerweel, Rob Basten, Jelmar den Boer, and Geert-Jan van Houtum started research. Within their research they focused on two aspects: When should an organization print or expedite, and what are the potential benefits of a general-purpose 3D printer in terms of operating costs, on-
site spare parts inventories, and system availability? A general-purpose 3D printer can print many different types of parts of reasonable quality, but not top quality. However, the printer is not expensive and is relatively easy to manage, which makes it suitable for almost any organization.

The model
To come up with results, the researchers proposed a model with three supply options: expedite, print, and wait for regular parts via the next replenishment. An important assumption within the model is the use of a 3D printed spare part as a temporary replacement. Rob: ‘We knew the reliability of a spare part printed from a general-purpose 3D printer was sufficient for one or two weeks. Therefore, we assumed that the printed parts constitute temporary solutions and are removed as soon as regular spare parts become available.’

The model was applied to a case study of the RNLA for her United Nations peacekeeping mission in Mali. Data were available of 3,000 parts of three types of vehicles. From these parts, a random sample was taken of 100 parts. Each of these parts was checked by experts to determine whether the part was suitable for printing. Rob explains why: “The RNLA already had a general-purpose 3D printer in Mali and could therefore only print composite parts.” Jelmar elaborates: “With the printer, we can print small plastic components, such as ammunition clips.”

It turned out that 14 parts were suitable for printing. In a case study with these 14 parts, Bram, Rob, Jelmar, and Geert-Jan concluded that, compared to only having regular shipments, the usage of the 3D printer could reduce the costs by 47% on average, and the inventory levels by 72%.

The future of 3D printing
The results are promising for all organizations that operate at remote locations: With 3D printing, money can be saved, inventory levels can be reduced, and still equipment availability can go up. Nevertheless, before 3D printing really could be used at remote locations, further research should be conducted. According to Rob and Jelmar, there are three categories for future research: the exact location where to print (at the remote location or some safer location near the remote location), the consequences of IP rights on 3D printing, and the potential of predictive maintenance for parts when printing higher quality parts takes multiple days.

Although more research should be conducted, 3D printing is already part of the agenda of the Ministry of Defence. Jelmar: “Since the paper, we are looking at what 3D printing could do for us. We now have a project where we cluster all the information and knowledge we have about 3D printing and use it to improve the operational side of the military. Therefore, it could only be a manner of time 3D printers will be used in our operations.”

More information?
You can find the complete journal paper at https://doi.org/10.1111/poms.13298. If you are interested in this research or future research on this topic, feel free to contact Rob Basten (r.j.i.basten@tue.nl). If you are interested in research for the RNLA, feel free to contact Jelmar den Boer (J.d.Boer.02@mindef.nl).
How will the world around us as students look like in 2030? If you really want to know the answer, a soothsayer would be very welcome. But what if we do not trust the crystal ball, how can we ever prepare for the insecure future? Better yet, how can we benefit from all swirling insecurities around us? You will not believe it yet, but after reading this article you will never read the newspapers the same way as you did before...

TEXT Bauke Wijnands DESIGN Caitlin Riesewijk

Prepare for the future without a crystal ball

Whereas others would rather stay far away from thinking about all insecurities the future may contain, Carel-Jan van Driel and Wim Nolles have made their passion of it.

Using scenario planning has supported the strategy of standardization. Since then, scenario planning has been used in Philips Research a lot. After they left the company, they met again and while enjoying a cup of coffee, they discussed about the essence of successfully implementing it within Philips. They saw opportunities in innovating the concept of scenario planning on how it was used at Philips, particularly within the research divisions. Currently, they are responsible for scenario planning at our department IE&IS. They prepare our department for the future by sketching plausible scenarios of the future world in 2031 our department will act in.

Evolution of scenario planning

The concept of scenario planning was introduced by Herman Kahn, one of the most prominent futurologists of the second half of the 20th century. His theories influenced the development of the United States’ nuclear strategy by suggesting to ‘think the unthinkable’, namely a nuclear war.

Further development of the concept was ensured by Shell. Pierre Wack, director of the planning group at the time was convinced that scenarios shouldn’t stick to expected occurrences, but rather focus on insecurities and structuring them. He said that scenario work involves ‘the gentle art of re-perceiving’. The first time Shell benefited from the use of scenario planning became clear during the oil crisis in 1973. Shell was prepared for the crisis and financial benefits exceeded...
billions of dollars. More recently, Shell created scenarios for a world that was facing a challenging energy transition. By adapting their vision in the 90s they have transformed from an oil producer to a company playing an important role in the energy sector, actively discovering alternative energy resources.

How are those scenarios actually constructed? The essence of scenario planning is trying to create a completely new perception of an unknown future world. By opening your mind for future situations and also gaining insight in the consequences of these situations, one can make better decisions now. Carel-Jan describes that employees within companies are used to write vision documents. “These documents are always based on known information, people stay within their comfort zone. Companies sometimes fully base their decisions on those documents. Then, unforeseen influences can have impact on an organization to a large extent. Where scenario planning aims for, is putting the known information on hold and exploring all insecurities around the play field of an organization. That’s where it becomes interesting!”

Within the research divisions of Philips, Carel-Jan and Wim recognized the value of scenario planning explicitly. Wim; “Around 1990 we often spoke about a future in which internet is being used by everyone on earth. Internet became a ‘buzz word’ since everyone talked about it, but nobody had even a little bit a perception of a world in which internet was used by everyone. However, in order to make decisions on how to deal with this future world, a clear perception of that world was required. Then scenarios can be written that describe those plausible future worlds. When that clear perception is present, then one can really benefit from this perception in terms of organizing innovation.”

**Read the newspaper differently**
The next step after writing the scenarios, is following the newspapers and monitoring the developing and evolving world around you. In case the newspapers are suggesting the world is heading in the direction described by one of the proposed scenarios, then organizations can already better prepare for the consequences of that particular scenario. Namely, the future world described in that scenario, or more likely, a scenario that looks like the world is becoming reality.

Carel-Jan immediately provides an example of ‘reading the newspaper in a different way’. “I was once reading a small article in the Eindhovens Dagblad about Mojo, an event organization offering well known pop concerts. It stated that for the first time, a pop artist earned more money by his performance on stage instead of the income from a CD. This was exactly one of the future worlds we described in our scenario planning project at the time. Namely, the digital world around sound recordings would change drastically. We focused a lot on copy protection, protecting the music and video’s being played on CD’s and DVD’s. This article changed our perception on how we should deal with copy protection, since music on sound recordings being used as promotion material was released openly now. The fact was that money was now earned at concerts, not by selling sound recordings. These had become a kind of promotional material to get people at concerts. This changed our complete strategy!”

**Shift the time axis**
How many times have you heard someone telling you “Oh, if I would..."
have known that earlier, I would have decided something else”? That’s exactly what scenario planning is about, after simply shifting the time axis. Namely, given that you have to make an important decision now that will have impact on your future life heavily. Think of multiple future worlds that seem plausible to become reality. Now, imagine yourself being in one of those future worlds; what logical decisions do you have to take in the past given that this future world has become reality? Wim: “Then decisions were no-brainers! If someone created several scenarios 10 years ago and one of those scenarios has now become reality, then it’s quite obvious which decisions had to be made.”

Wim; “My assumption is based on scenarios they already created 20 years ago, they have taken decisions to invest in wind farms. For outsiders this decision may have come as a surprise. However, in all likelihood they already described this decision years ago in one of their scenarios in which the climate crisis would gain attention. Now the climate crisis is actually gaining attention, the decision for investments in wind farms is quite easy, right?”

**Change management**
In order to actually make decisions based on these scenarios, involvement and alignment within an organization where all stakeholders are committed is crucial. Also, scenarios written by senior management members can differ from scenarios proposed by young talents. Wim: “Therefore, it’s valuable to let people from various positions share their perceptions of future worlds, in order to broaden the organizational view.”

He adds: “Next to choosing the right authors for the scenarios, it’s important to think at the start of the scenario planning project about ways to make people part of the scenarios and to communicate the outcomes of the scenarios. Not only senior management should be convinced of the scenarios and the decisions based on those scenarios. The whole organization should! Therefore, the form of the stories is important as well.”

**IE&IS in 2031**
The crystal ball mentioned earlier can in fact be used to determine the exact question you would like to ask yourself. Carel-Jan clarifies: “What is the key question you want to ask yourself? However, after that the crystal ball can’t be used anymore because the idea of a crystal ball is that it tells you exactly what will happen in the future. In scenario planning one also looks forward, but rather by imagining the future world from what is uncertain and exploring what could happen and sketching those worlds.”

Currently, Carel-Jan and Wim are facilitating the process to create the scenarios for our department I&E&IS which should describe plausible future worlds in 2031 relevant for the department. Together with a diverse group of department members the scenarios are being written and they should form a foundation for future decisions.

Now, without being in possession of the crystal ball; how do you think the world around our department will look like in 2030?

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**Carel - Jan van Driel**

Carel-Jan, alumni of the TU/e as former Electrotechnics student, has been working for more than 30 years at Philips and Signify. He started as researcher and ended up being head responsible of multiple research labs worldwide. Being trained as a facilitator for teams in transformation, he left the company and further specialized in coaching as well. At this moment Carel-Jan has his own company “Catch the Tide” specialized in coaching coach trainings and facilitating teams in transformation.

**Wim Nolles**

Wim, studied Physics, Mathematics and Chemistry in Leiden, also joined Philips during the mid eighties and started at the IT division. Wim was trained in scenario planning and had contact with the strategy department at Philips.

Wim and Carel-Jan met each other while Carel-Jan was responsible for the worldwide standardization of CE (Consumer Electronics) products.
If you’re thinking about the future, it will be most likely that all kinds of advanced technologies and smart solutions will come to mind. Artificial Intelligence, robotization, and the Internet of Things. These and other technological developments are already playing a role nowadays and will become even more important in the future. For these developments, especially hard skills are required. Therefore, to remain successful in the future, both employees and employers should focus on these hard skills.

Although previously mentioned technological developments are going to be important in the future, it is very difficult, if not impossible, to predict what this technological future will look like. Namely, the inevitability of change is one of the few universal constants in life. A famous quote is: “The best way to predict the future is to create it”. By modeling, analyzing, and designing organizational processes we, as Industrial Engineers, find ourselves in the unique position to be able to play a vital role in creating that future.

However, this technological future and their required hard skills are only one side of the coin. According to the World Economic Forum (WEF), soft skills will also be essential in the upcoming years to remain successful. These soft skills will determine for organizations to what extent hard skills will be effective and efficient. Especially, since it is hard to say what the key future hard skills will be, it is very important to train specific soft skills like adaptability and flexibility.

For more than a month now, I am studying for my semester abroad in Linköping (Sweden). While in Eindhoven the focus is much more on the hard skills, here I am working mainly on my soft skills. Especially, networking and all the skills which are involved are trained when you are studying abroad. Networking will also (still) matter in the future, according to the WEF. It did not go unnoticed that I am actively working on these soft skills here. One of the questions that was asked during a game called “Who’s most likely to” was: “Who is most likely to network at a funeral?” Yes, everyone was pointing at me. Let’s just consider it as a compliment and further focus on improving my soft skills. In the end, “the future depends on what we do in the present”. 
What will the future bring? Passed years have been fully under the spell of the coronavirus. We have learned living in another way than before, totally creating a makeover of our working environment. We notice that life can be full of uncertainties, maybe more than ever before. So therefore I raise the first question again: “What will the future bring?”. For me personally, I think the future will remain very uncertain but provides great opportunities. Due to rising prices for fossil fuels, the time is set to invest in a more circular economy so that we as the Netherlands will be able to handle our own product life cycle. The interdependencies between countries keep changing and with pandemics as a reasonable possibility, the step towards a self-serving economy is of utmost importance. Working together in the smartest region of the world, namely Eindhoven, we can provide the first steps. Therefore, I hope all students and companies make socially responsible choices in their future career to provide a great share for all of us. Furthermore, with the aging population of the Netherlands we are ought to find options to sustainably compensate the elderly and provide enough opportunities for starters just like us students. Hopefully, the politics in the Netherlands will be able to set a bright future for all of us. So vote on the 16th of March to influence the future on your behalf! Let’s make it bright for all of us!

Daan van Strien
Chairman Industria

Bright future

Every child has some imaginations about what she/he expects to be as a grown-up in the future. If you ask 4-year-old Lynette, she would have answered: a princess! 10-year-old me was already a bit more realistic and wanted to be a doctor. Fast forward to the present, I am studying Industrial Engineering and I like it a lot. However, at what job I will eventually end up; I am not sure yet. Maybe my future job might not even be invented at this time of writing...

In my opinion, there will be many possibilities for an Industrial Engineer in the future. Think for example about the fast-evolving technologies; someone has to be the bridge between all these technical aspects and the consumers. Or look at the increasing demand within the service industry, there are many options to apply the IE knowledge as well. One thing is clear, gathered data will become even more important. Moreover, analyzing and acting appropriately on the outcomes is a part that should not be forgotten. Luckily, Industrial Engineers are trained to consider the different aspects at stake and will move forward with the optimal solution.

So, where I or my fellow students might end up, we do not know yet. But the wonderful thing about the future is that no one knows how it will unfold itself, but it sure is nice to speculate about. Where do you think you will be a couple years into the future?

Lynette Haksel
Educational Officer

Into the future
Alumnia Board Update

General
Yet another year of Corona and many people started to lose heart. How much longer do we have to work remotely? How much longer do we have to postpone the holidays? And when can we finally celebrate a party together again? Fortunately, since the 25th of February most measures have been released and we can slowly turn back to the old standards. Most of us have already enjoyed drinking a beer on Stratumseind during Carnival or snowboarding the first meters somewhere abroad.

This also means a filled agenda for Alumnia now it is allowed to schedule physical (and hybrid) activities again. Luckily, last year we were able to do some hybrid activities already and in the summer we even enjoyed a perfect summer day during the outdoor event on the beach.

Looking ahead, the annual planning of 2022 is finished, together with Industria, and we can look forward to a physical TBKx. In the summer there will be another outdoor activity, and in the winter we have scheduled some interesting key notes. As icing on the cake, Alumnia is celebrating their 9th lustrum this year. We hope to toast with all of you during an extensive lustrum drink or welcome you on one of our other activities!

In the meantime, a lot has happened behind the scenes as well. Unfortunately, we said goodbye to Martijn van Aspert as chairman of the board and Loek Botman as treasurer of the board, during the last General Assembly on the 7th of February.

We are happy to announce that Daphne Schijvenaars took over the baton from Loek as treasurer, Harm van Duijnhoven has joined the board as a general board member, and I have taken over the position of Martijn as chairman. This means the team includes 6 members again and looks as follows:

Upcoming activities:
- March 18 - BBQ
- March 23 - TBKx
- May 20 - Lustrumdrink
- July 27 - Outdoor Activity

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Introduction - Daphne Schijvenaars
My name is Daphne Schijvenaars and recently joined the Alumnia board as treasurer. I would like to use this opportunity to introduce myself to all current and potential Alumnia members. In November 2019, I obtained my master’s degree in Operations Management and Logistics. Thereafter, I started working at the logistics department of IFF, an international flavors and fragrances manufacturing company. Currently working there as Business Process Engineer Supply Chain. In this role I am responsible for continuous improvement projects for the supply chain of the Tilburg plant.

During my studies I have been member of several Industria committees, including the 32nd board. A few months ago, I met Loek when we were both at the TU/e again and he let me know this would be his last year as a board member. The opportunity to be actively involved with a group of graduates who together have a shared field of interest and a broad range of different experiences, I couldn’t pass.

I am very excited to take over the position of Loek and look forward to organize intellectual and social activities, especially now that it is possible again. Hope to see many of you at one of our upcoming events.

Introduction - Harm van Duijnhoven
During the last ALV I was hammered in as a general board member of Alumnia. Therefore, I would like to introduce myself to the Alumnia and Industria members. My name is Harm van Duijnhoven and I grew up in Wanroij. I exchanged the small Wanroij for ‘the big city’ Eindhoven when I started studying Industrial Engineering. With the start of my studies, my time as an active member at Industria also started. In my first year I was able to organize the F.A.C.U.L.T.I. parties and later followed by the Company Tour and Cantus. During my master’s I was part of the International Research Project board as treasurer. This resulted in a very cool trip along the West Coast of the USA. In September I graduated from the Master Operations Management and Logistics and started working as an Inventory Analyst at ASML.

At ASML I met Martijn van Aspert and he let me know that Alumnia was looking for new fresh energy. Of course, I could not pass up this opportunity. Alumnia offers a wonderful platform to stay in touch with acquaintances from your student days and I would like to contribute to this. With the end of corona in sight, I am enthusiastic to organize many cool activities again this year. I’m already looking forward to it, hope to see you soon!

TBKx
The first upcoming activity is TBKx. The event will take place in Eindhoven at the Ketelhuis on March 23rd. This year we will discuss many interesting topics related to the general theme Circular Economy: Accelerating the transition to sustainable future businesses. For more information, have a look at our website www.alumnia.nl. Don’t forget to register yourself for the event.

Tom Koks
Chairman Alumnia
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 Bernadette Deitmers & Bas de Vries DESIGN Caitlin Riesewijk

Bernadette Deitmers - van der Kuy

What has your career been like so far?
During my studies, I knew that I aspired to a managerial position. My first employer
is MSD, Merck Sharp & Dohme, a large American pharmaceutical company. I had
three leadership positions there. Started as a supervisor of a packaging department to
grow through manager of this department to manager planning. For me, these
years have laid a solid foundation for my leadership skills and working with and/
or motivating employees. A very nice intensive period in which working weeks of
60 hours was self-evident.

And then children came. It had ABC to juggle my attention for work and home.
With the arrival of my third child, I changed course. It was a difficult choice
to let go of ‘my career’. Stephen Covey’s second characteristic ‘Begin with the end
in mind’, has helped me enormously. I opted for the most enjoyable part of my
job: letting people grow in their personal development, empowering them.

In addition, I also focus on supporting members of l’Attaque Attique. I was at
the cradle of this Industrial Engineering dispute, which has grown into a wonderful
network of female IE engineers. Finally, I recently joined the group of
coaches of the GURU program of the TU/e Innovation Space, supporting starters who
are working on sustainability in setting up their team / business.

What makes you happy in your work?
Personal development, always continuing to grow is one of my core values. The fact
that I can play a role for others gives me energy. In order to be able to continue to
do this, my own development is also going on. By following training courses, reading
books and intervision groups, I keep my own inspiration at a high level.

What was the most important moment in your career and why?
For me, three moments stand out. The moment I realized that I wanted to balance
work and home life more, was a very important moment for me. Letting go of
my primary focus on work. It has given direction to the rest of my career.

A second important moment is starting Savvy Training. Really standing on your
own two feet: running your own business. I had to grow in that, a little more every
year. The third moment is not so long ago. The realization that I want to pass on my
knowledge and experience to the younger generation. That has led me to set up the
reunion club C’est l’Attaque and to work as a GURU coach.

How could the training in Business Administration at TUE be further improved?
In terms of content, I thought it was a great education. An active alumni network
is what would make the programme even stronger. The further I get in my career, the
more I realize that with a strong network you can really make a difference.

How do you distinguish yourself as a business manager from managers with a
different background?
My education has taught me to think broadly, to put things in a bigger picture.
Although I often don’t know the details of the coachee’s work, I can think broadly
and spar with coaches at that level.

New question:
Looking back on your career, would you make the same choices with today’s
knowledge?

Why:
Reflecting is, in my opinion, one of the most important ways to learn. I like to
reflect and by sharing your reflections with other IE-ers, you might be able to give
them new refreshing insights.

Bernadette Deitmers

Age: 57
Graduation year: 1989
Role: Founder Savvy Training
Company: Savvy Training

SCOPE MARCH 2022

Nick van Lanschot
SCOPE 2, 2022
Entrepreneur at
NDI ICT, I.E.T.,
Allurion, Ulthera and
CoolSculpting Kliniek

Hubert Deitmers
SCOPE 4, 2021
Founder/owner Endeit
Capital
Bas de Vries

What has your career been like so far?
After graduating, I started as a Consultant Supply Chain Strategy at Deloitte. I mainly did projects in the field of Network Design in various sectors. At a certain point I started to miss the practical side, because as a consultant you are usually only involved in the plan & not in the execution. Then I became a Network Planner at KLM Cargo, which fitted in well with my experience at Deloitte. In the past year I have made a career switch, by doing something different in terms of both industry and function. Now, as Operations Manager at Picnic, I am responsible for the operation at a Fulfilment Center.

Why did you choose the industry you work in now?
During COVID, my job at KLM suddenly changed from a strategic/tactical to an operational character. I liked this so much that, after the operational part at KLM decreased when the COVID situation stabilized, I started looking for another job. In addition, I wanted to work for a company that has a lot of change and growth. The reason I now work for an online supermarket is not so much driven by the industry, but more by the phase that the company is in.

How do your expectations about your career during your student days differ from today?
During my student days I was very focused on my career, and I had high expectations of working & making a career. I’m now more focused on having a nice job and not so much making a career itself. I also found out that the ideal job does not exist, which I thought during my student days.

A technical business expert often knows how to look closely at the bigger picture. Suppose you can exchange with Mark Rutte for a week and the Netherlands is your BV, which 2 things would you find important and tackle?
As the Netherlands, we are becoming more and more a knowledge-driven economy. However, it remains essential that we have enough people who can & want to work with their hands. This will be necessary to be able to tackle, for example, the housing & climate crises.

In addition, I would like to tackle the tax & surcharge system. It has become impracticable for the government, and incomprehensible to the citizen. I advise those interested to read Pieter Omtzigt’s book, after which it becomes clear how complicated this system has become.

What advice would you like to give current students?
Try not to make too much of an image of an ideal company or job. Go for a job that appeals to you, and where you have a good feeling about the company & your future colleagues. In the end, you only really know what it’s like when you experience it yourself.

New question: A technical business expert often knows how to see the bigger picture. Suppose you can exchange a week with the Minister of Climate, how would you tackle the current crises in the field of CO2 and nitrogen?
Why: I think that a specific question on a particular topic can yield interesting points of view. I’m curious how someone with IE glasses on looks at these crises.

Bas de Vries

Age: 30
Graduation year: 2015
Role: Operations Manager
Company: Picnic

Luke van de Bunt
SCOPE 4, 2021
Manager Network Management at Den Hartogh Logistics

Bram Sprenkels
SCOPE 2, 2022
Manager Supply Chain Strategy at Deloitte Nederland

MARCH 2022 SCOPE
2500 prints at Industria, Alumnia & companies

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