

STORIES FROM THE WORLD OF THE VOLVO GROUP

AR INSIDE!



Volvo Group magazine 3.2019

**SINGAPORE
– A DIGITAL LAB**

**3 SOLUTIONS IN
A FUTURE FACTORY**

**CREATIVE HEIGHTS
AT CAMPX**

ACCELERATING CHANGE

– PERFORMANCE AND TRANSFORMATION
WILL TAKE THE VOLVO GROUP INTO A NEW ERA

What will we pass on to the next generation?

DURING THE PAST years, we have taken many important steps forward as a company. We have worked in close partnership with our customers and have succeeded in meeting high demand for our products and services. At the same time, we have launched new products, worked on continuous improvements, raised our quality levels and grown our service business. The result of all the efforts that have been made by colleagues, suppliers and business partners all over the world has been increased profitability and a strong financial position. I am proud of what we have achieved together.

We must continue this work in order to remain a company that creates value for its customers, its employees, society and its owners – both at times when the economy is strong and when the situation is more challenging. The work we are doing in the here and now will always be the foundation on which we stand.

At the same time, it is important that we also look ahead to the future and think about the bigger questions. What kind of company do we want to pass on when it is time for others to take over? And what kind of world would we like to hand to the next generation?

We are facing huge challenges when it comes to both climate change and a growing world population. At the same time, the digital society is creating real potential for us as the need for transport and infrastructure constantly increases. During these societal developments,

it is our job to make a positive contribution by offering transport solutions that are safer, more sustainable and more efficient than those we currently have. Then we can create better conditions for more people without imposing a burden on our planet that exceeds its natural and absolute limits.

WE HAVE ALREADY shown that we are able to produce solutions that both reduce carbon emissions and cut operating costs for our customers. It is now up to us, in collaboration with our partners, to accelerate both the development and the commercialisation of truly sustainable transport and infrastructure solutions. We can really make a difference – today and for the generations to come.

So, when it is 2030 and you look back at a fantastic period of development and change, what will you be most proud of? What contribution will you have made? ■

MARTIN LUNDSTEDT
PRESIDENT AND CEO,
VOLVO GROUP



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Singapore: a smart nation

Singapore's Smart Nation initiative has won awards and accolades for its vision of using digitalisation to enhance people's daily lives. The Volvo Group aims to be part of the journey.



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Volvo CE is already using the next generation of mobile networking to develop autonomous solutions.

24 The future of manufacturing

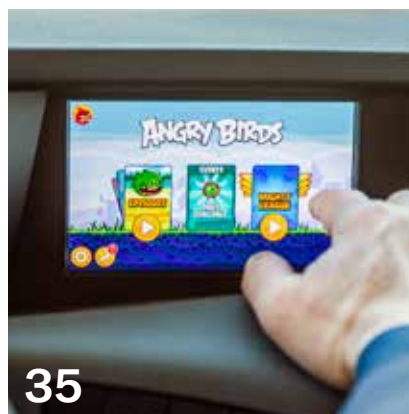
New high-tech solutions play an important role as production sites prepare for tomorrow.

30 Every drop counts

Meet Xavier Delacour, one of the engineers working on developing the diesel engine.

35 New technology, new opportunities

New innovations can help the Volvo Group climb the service ladder. Here are four examples.



ALWAYS INSIDE

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PHOTO: VOLVO TRUCKS

Efficient fuel-saving

THE VOLVO FH with I-Save is Volvo Trucks' solution to leading fuel efficiency for haulage companies in the long-haul segment. By combining the new D13TC engine with updated fuel-saving features, fuel costs can be cut by up to seven per cent – without compromising drivability. The background is the growing demand for transportation across Europe, with trucks covering increasingly longer distances. At the same time, transport operators are faced with rising diesel prices putting pressure on profitability.

Volvo FH with I-Save has been available to order in European markets since March 2019.

PHOTO: JEANETTE COLTEN



The investment in the foundry in Skövde will lead to greater flexibility regarding products and materials.

Volvo Group investing in Skövde

THE VOLVO GROUP HAS decided to invest 1.6 billion SEK in the foundry in Skövde and the investment will be implemented over the next four years. The main purpose of the investment is greater flexibility regarding products and materials. It also means more sustainable manufacturing with lower energy consumption and reduced consumption of non-renewable materials.

"In addition to the technological step we are taking, the initiative means that we are prepared for future products, processes and environmental challenges. This is another step towards sustainable manufacturing," says Lennart Richardsson, VP Skövde Plant.



Ghent plant awarded for improving ergonomics

WITH A CHANGED mindset, involving all colleagues, the Ghent Plant improved the working conditions with a more ergonomic way of working. The project team of the initiative received the 2018 Volvo Group Health and Safety Award for their work. Fanny Bensaid, VPS Manager, Koen Knippenberg, VP Operations Ghent Plant, Annelies Note, Health & Safety Manager, and Anneleen Verhaeghe, Prevention Adviser Ergonomics, received congratulations and a diploma from President & CEO Martin Lundstedt.



Read more about the work in Ghent in Anneleen Verhaeghe's column on page 67.

PHOTO: CAMILLA MELANDER KANZ



Martin Lundstedt and the project team from Ghent celebrating together.

480 drivers in a new project

THE VOLVO GROUP has been running vocational school projects for mechanics in Africa for several years. The first vocational school project for truck drivers has now been launched. It will take place at the Selam Technical and Vocational Centre in Addis Ababa. Some 480 students will be trained each year. The co-operation partners include Swedish International Development Co-operation Agency and the United Nations Industrial Development.



PHOTO: VOLVO GROUP

The vocational school project in Ethiopia is the first of its kind, aimed at truck drivers.

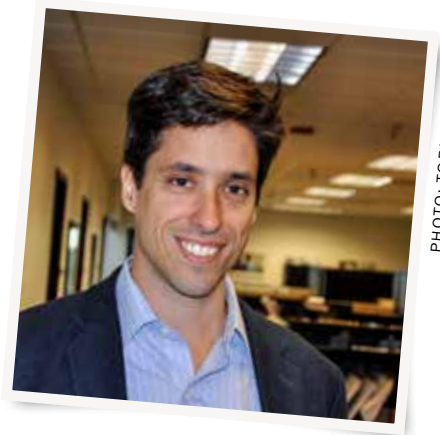


PHOTO: TOBIAS WILHELM

HELLO...

... Manuel Aguirre, Market Intelligence Manager Volvo Financial Services

You work in the VFS iLAB – what is that?

"It is short for Innovation Lab and an informal name for our team, which focuses on strategy and innovation within VFS. We have several initiatives related to it, one being the iLABX Accelerator Program where we work together with start-ups. Other areas include business strategy in these times of disruption and how to work internally to help create a culture of innovation."

What has been the highlight so far in your job?

"What I like about VFS is that we can get things done fast. One of the main tangible highlights was the Demo day of iLABX. It was the result of a year-long programme that I had the opportunity to project manage, with seven start-up companies connected to our business challenges and the latest developments in Fintech."

What is the next step?

"We've planted a seed for a long-term collaboration with some of these start-ups, so we will see if we can bring the ideas into a commercial offer. Internally, I think we can see the potential and the power of this type of collaboration. For this particular case, it was mostly VFS, but the real power is when we do this as the Volvo Group!"

TOBIAS WILHELM

CampX – more than an office

THE VOLVO GROUP'S NEW

innovation concept in Gothenburg, Sweden, is more than just an office. It represents a new, collaborative way of working for the Volvo Group and its partners. The site was inaugurated on March 29 to showcase innovation at the Volvo Group. Many of the 150 specially invited guests were driven to the event in a fully autonomous, electric bus by Volvo Buses.

The 8,000-m2 centre is open to Volvo Group partners, suppliers, universities and society stakeholders. It includes office space for hundreds of employees, concept labs and collaboration areas.

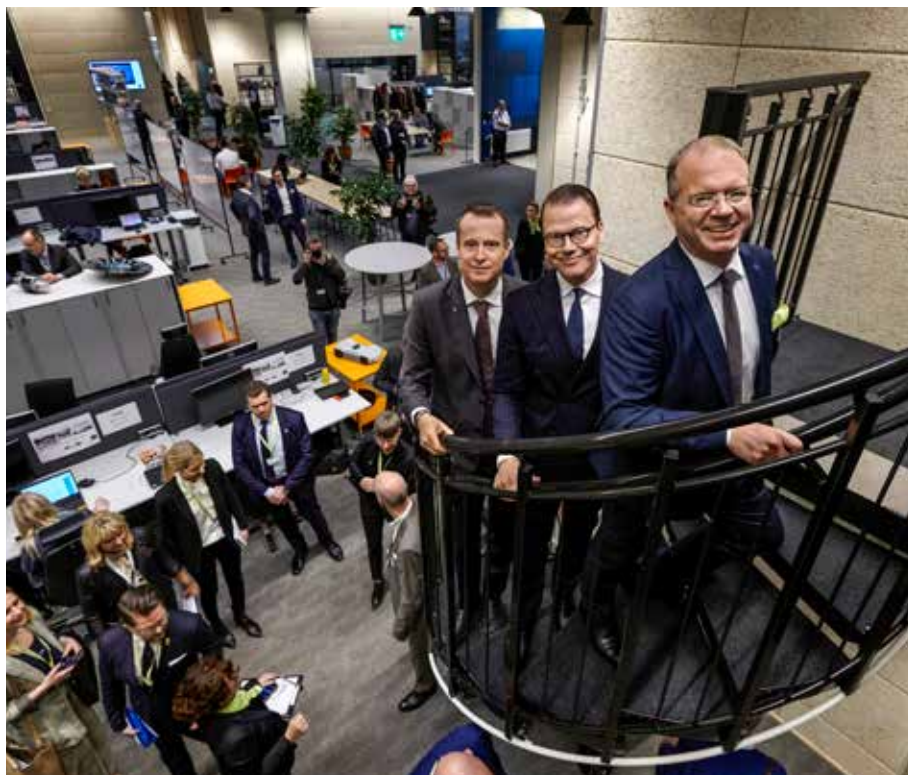


PHOTO: CICCIO JONSON

The guests of the inauguration included the employees based in CampX and industry leaders, politicians, researchers and Sweden's Prince Daniel.



Read more about CampX on pages 54-58.



PHOTO: CICCIO JONSON

Hundreds of visitors got a glimpse of some of the Volvo Group's products.

A strong line-up on display

THE INHABITANTS OF Gothenburg had a chance to experience the width and depth of the Volvo Group outside the Annual General Meeting in April. The product range on display was something out of the ordinary and the Volvo Group experts were busy explaining more about the HX02 and Vera to curious visitors.

PHOTO: VOLVO BUSES



Outstanding design wins prize

THE VOLVO 9900 long-distance coach wins the Red Dot Product Design Award. Red Dot Product Design is one of the world's largest design competitions and it is only awarded to products that feature an outstanding design. With designers and manufacturers from 55 countries applying to the competition with more than 5,500 products, Volvo Buses award won in the face of stiff competition.

AR issue nominated!

EARLIER THIS YEAR, the Volvo Group Magazine #5 2018 was nominated in the Swedish Content Awards. The magazine was published at the same time as the Volvo Group AR Stories app was launched and some of the stories could be experienced in augmented reality. If you missed it, you have a new chance to experience AR in this issue. Have a look at the factory of the future on pages 26-27.



THE NUMBER

50%

Volvo Buses' target for female external hires to secure a diverse workforce.

PHOTO: ROSENBAUER



Fire fighting goes electric

VOLVO PENTA WILL design and deliver an electric driveline with leading fire service vehicle manufacturer and longstanding customer Rosenbauer. "This partnership is the first of many as Volvo Penta expands its competence in the field, and builds an innovative electromobility platform for the future," says Björn Ingemansson, President of Volvo Penta.

Rosenbauer's Concept Fire Truck is scheduled for 2021.

VFS winners

THE WINNERS OF the 2019 VFS Communication and Marketing Award:

- **Best Total Offer Campaign:** VFS USA – Smart Commercial Account
- **Best Internal Communication Initiative:** VFS EMEA – Pay it Forward week
- **Best Digital Customer Communication:** VFS China – WeChat launch



Learn more about exciting new products and services from VFS on page 38.

EDITOR'S NOTE

Change is coming

AN OLD SAYING goes that "the only constant in life is change". True, but whoever came up with that first couldn't possibly have anticipated the accelerating pace of change up until our day and age. In this issue, we have tried to capture the spirit of change in our industry and beyond. This very magazine is no exception to the rule, and Volvo Group Magazine will undergo a change and come back in 2020.

Until then, enjoy your reading!

TOBIAS WILHELM, EDITOR IN CHIEF



WELCOME TO THE SMART NATION



Few countries in the world are embracing the digital revolution with as much enthusiasm as Singapore.

Under the Smart Nation initiative, the small city-state is exploring many and varied ways of enhancing people's daily lives through technology.

TEXT NIC TOWNSEND PHOTO COLOURBOX & SAM CHIN



DESPITE ITS SIZE and lack of natural resources, Singapore has long been a regional and global hub for finance, trade, tourism, innovation, transport and technology. Its robust economy and business-friendly climate allows entrepreneurship and innovation to flourish and its citizens enjoy living standards that are among the highest in the world.

A key part of Singapore's success is its willingness to embrace change and seize new opportunities for growth, particularly when it comes to technology. It tops the World Economic Forum's Technology Readiness index, which measures a country's ability to benefit from information and communication technology (ICT). Last year, Singapore was awarded Smart City of 2018 at the Smart City Expo World Congress in Barcelona.

Singapore is also in a prime position to reap the full benefits of digitalisation. Through its Smart Nation project, it is actively looking to



SINGAPORE

Area: 750 km²

Population: 5.6 million

Density: 7,804 per km²

GDP per capita: \$98,014 (3rd highest in the world)

Languages: English, Malay, Chinese and Tamil

harness this rapid technological change to make life even better for its 5.6 million citizens. "The digital revolution is fundamentally changing the way economic value is created, the way work is organised, the way our societies communicate and how we live," says Tan Chee Hau, Director, Planning and Prioritisation Directorate, Smart Nation and Digital Government Office, Singapore. "To stay relevant in the world, Singapore has to embrace digitalisation, just as we embraced globalisation and industrialisation in the past."

AS PART OF Smart Nation, a number of national projects and initiatives are currently being run by public agencies and the private sector, to drive change within health, education, transport, urban solutions and finance. Some of the successful initiatives so far include the launch of SingPass Mobile, an app that uses biometrics for online authentication and eliminates the need to remember passwords. It is currently being used by 200,000 people.

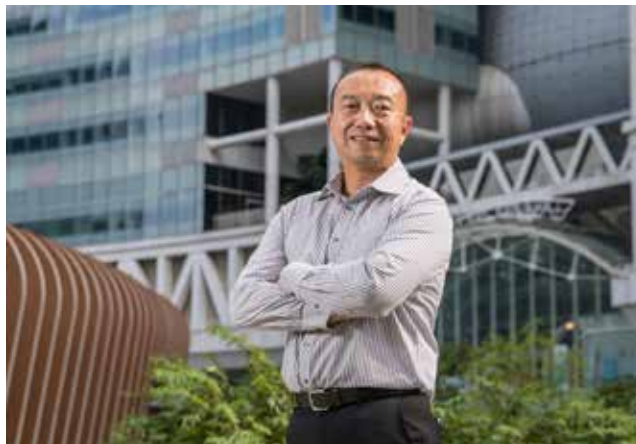
How has digitalisation affected your daily life?



Christina Cortese

DIRECTOR, COMMERCIAL DEVELOPMENT, VOLVO BUSES ASIA PACIFIC

"Digitalisation has made everything so much more accessible! I have a pretty busy schedule, so being able to order anything I need, manage my bills and book travel – all via apps – makes life so much easier! In fact, I feel it has given me more liberty and flexibility to do things my way and according to my time. I'm on Google on a daily basis. Whenever I do not know something, I grab my device and search for answers. I also find that Youtube is a great library for documentaries."



Marcus Mak

SENIOR TECHNICAL SERVICE MANAGER, VOLVO BUSES

"Life has become simple with digitalisation. Nowadays we can complete most transactions without even opening our wallets. Skype enables us to communicate with colleagues and friends all over the world with a click of a button. Internet banking means I can complete all my banking needs at home. Even our industry has seen tremendous changes. With telematics, we can now read fault codes from a vehicle and prepare the workshop for any needed repairs before it even arrives."

Smart Nation has also seen the establishment of an interoperable e-payments system. One of the key initiatives is the PayNow system, which enables individuals and businesses to make real-time money transfers just using the other party's mobile number or national identification number. Meanwhile, the Moments of Life programme has seen government services, such as birth registrations and immunisation records, digitalised and streamlined onto one platform, saving people time and reducing paperwork. These are just some of the many examples to come out of Smart Nation so far, with many more still in development.

"We see Smart Nation as a continuous journey," says Tan Chee Hau. "Currently, we have good foundations in place, such as a highly educated population, robust legislation for data protection and cybersecurity and a vibrant and innovative ICT industry. We are paying particular attention to improving public-private collaboration, such as making available more Government data, APIs and digital platforms that

"We must be able to quickly go back to the drawing board, try something else and keep improving. It's like making the whole nation a living digital lab."

TAN CHEE HAU, DIRECTOR SMART NATION AND DIGITAL GOVERNMENT OFFICE

companies can use to provide innovative services and generate new business opportunities."

One of the strengths of Smart Nation is its inclusiveness, and a continued focus on creating services that deliver real, tangible value to people. "We want to involve the entire population in Smart Nation," explains Tan Chee Hau. "We want to gather feedback at scale, so we can develop products and services that meet their



Jonathan Chong

HUMAN RESOURCES EXECUTIVE, VOLVO GROUP

"Digitalisation allows me to maximise my time and be more productive. I can plan journeys in advance to find the shortest routes and get updates on traffic conditions, bus and train arrival/departure times. I use apps for social media, news, shopping, travelling, Skype, internet banking and games. But my favourite is Audible, which enables me to listen to audiobooks while travelling. This means I can still complete my daily dose of reading even on very busy days."



Yuki Wu

MARKETING & LOGISTICS MANAGER, VOLVO BUSES REGION SINGAPORE

"Digitalisation is definitely making my daily life so much easier, more fun and more informative. I use the TED Talks app every day, and often have video calls with my parents using WeChat. But what has had the biggest impact on my daily life is an app called Coursera, which provides online courses from top universities around the world. It allows me the flexibility to learn anywhere, at any time, and has been a huge help with my career development."

“We can create possibilities for ourselves beyond what we imagined possible”

TAN CHEE HAU, DIRECTOR SMART NATION AND DIGITAL GOVERNMENT OFFICE

needs. Our services must be made more user-friendly, convenient and accessible to everyone. Sometimes, when things don't work so well, we must be able to quickly go back to the drawing board, try something else and keep improving. It's like making the whole nation a living digital lab.”

Some of the ambitious projects and trials currently underway within Smart Nation include large-scale systems for digital identification, e-payments and data traffic to smaller niche services such as alerts for the elderly or the monitoring of dengue through traps with sensors that help identify mosquitos.

“I am optimistic that improvements will take place even faster than we have currently planned,” says Tan Chee Hau. “For example, Singapore just announced that we will be trialling air taxis. When I was young, this was a scene only found in sci-fi movies. But it's incredible that it's almost here already. We need to continually push the boundaries, which is why we believe that Smart Nation is where we can create possibilities for ourselves beyond what we imagined possible.” ■



Last year, Singapore was awarded Smart City of 2018 for its initiatives to find new solutions.



Autonomous vehicles to drive Singapore forward

In Singapore's Smart Nation, public transport will be safe, clean, electric and autonomous. Efforts to make this vision possible are already underway and Volvo Buses is heavily involved.

TEXT NIC TOWNSEND PHOTO VOLVO BUSES

SINGAPORE'S LAND TRANSPORT Masterplan 2040 sets out some ambitious goals for the city's public transport. By 2040, all citizens should be within a 20-minute commute of a neighbourhood centre using public and shared transport, and nine out of ten peak-hour journeys across the city should be completed within 45 minutes.

A number of ideas are currently being explored to make this vision possible, including on-demand buses, air-taxis, and autonomous vehicles.

The Land Transport Authority of Singapore (LTA) hopes to see autonomous vehicles in scheduled public transport by 2022 and it has established a partnership with the Nanyang Technological University (NTU) to help develop the technology to make this possible. Earlier



Left: The all-electric Volvo 7900 bus is currently undergoing vigorous testing at NTU's Centre of Excellence for Testing and Research of Autonomous vehicles (CETRAN), a purpose-built facility for automation that replicates Singapore's road conditions.

Below: Professor Subra Suresh, NTU President, and Håkan Agnevall, President Volvo Buses, at a press event at NTU earlier this year.



Håkan Agnevall

this year, Volvo Buses delivered the first of two all-electric Volvo 7900 buses, and it is currently undergoing vigorous testing on NTU's campus.

THE 12-METRE SINGLE-DECK bus is the world's first full-size, autonomous electric bus and it is equipped with numerous sensors and navigation controls managed by a comprehensive artificial intelligence (AI) system. It is hoped that the test route can soon be extended beyond NTU's campus and subsequently used in off-peak services in residential areas.

"This fully autonomous electric bus will play a role in shaping the future of public transportation that is safe, efficient, reliable and comfortable for all commuters," said NTU President Professor Subra Suresh, on the delivery of the Volvo 7900 last March. "This research project not

only involves cutting-edge science, technology and AI, but is also an excellent example of close partnership among academia, industry and government agencies in translating basic research into products and services for the benefit of Singapore and beyond."

THE PROJECT IS also significant for Volvo Buses since it represents its first application of an autonomous solution in public transport. "Together with NTU and LTA, we now have the possibility of testing various solutions in realistic conditions," says Håkan Agnevall, President Volvo Buses. "The technology developed for Singapore can contribute to future autonomous applications by Volvo Buses. It represents a key milestone for the industry and is an important step towards our vision for a cleaner, safer and smarter city." ■

How digitalisation changes behaviour

The value of a new technology is realised when it changes business models and people's behaviour. The music, travel and banking industries have all been transformed. Now the transport industry is set for a great shift.

THERE IS A big difference between digitisation and digitalisation. Daniele Capasso, a strategist at Volvo Group focusing on external innovation and new business models, wants more people to understand why.

While *digitisation* turns physical information into digital, *digitalisation* creates a new social context and ultimately changes human behaviour. It also gives rise to totally new business models and revenue streams.

Take the travel industry. The difference between booking a hotel through a website or doing it over the phone is pretty small and an example of digitisation.

In contrast, the travel website Airbnb fundamentally altered how the entire hospitality industry operates. It has changed the way people choose to travel and created new revenue

opportunities for a different group of people. It is therefore an example of digitalisation.

Daniele Capasso expects that this type of shift is set to speed up across all industries due to the convergence of technologies such as high-speed connectivity, the internet of things (IoT) and artificial intelligence (AI).

WHAT DOES THIS mean for the Volvo Group? For businesses, digitalisation can provide new opportunities, if they are ready and willing to seize them. "Running a digital business means being open to create with others, including customers, partners and competitors. It is about exploring new ideas, allowing risk-taking and supporting disruptive thinking," says Daniele Capasso. ■

LINA TÖRNQUIST

Some key years in digitalisation

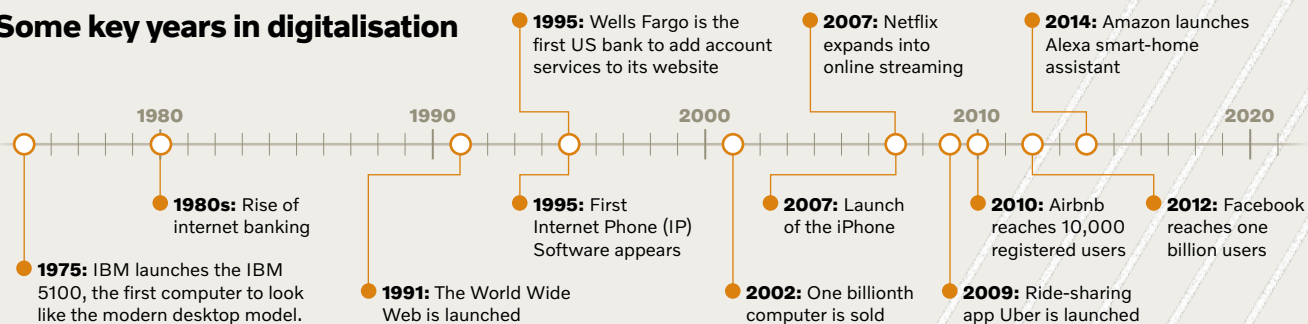




ILLUSTRATION: ERIK NYLUND

What is the difference between digitisation and digitalisation?

DIGITISATION IS THE conversion of information from a physical format into a digital one. Digitalisation, on the other hand, uses digital technologies to radically alter the way in which people interact. For businesses, it changes the ways businesses, employees and customers communicate and connect. Digitalisation transforms business models, by providing new revenue and value-producing opportunities.

Digitalisation transformed the music industry

IN THE EARLY 2000s, music was mostly sold in the form of CDs. As the internet-based distribution of music took hold, industry revenues dropped significantly. Today, the overall music industry has reached the same size as before this digital transformation but the source of that income is different. Revenue from streaming services such as Spotify contribute a sizeable portion, but the majority of revenue is now generated from live performances.

Digital pioneers

DIGITALISATION IS CHANGING the context for human interactions: how people keep in contact with friends, shop, vacation or hail a cab. Here are some notable examples of companies that have led to a digital transformation.

- Amazon (1994)
- Google (1998)
- Tencent (1998)
- Alibaba (1999)
- Skype (2003)
- Facebook (2005)
- YouTube (2005)
- Spotify (2006)
- Airbnb (2008)
- Uber (2009)
- Whatsapp (2009)
- Instagram (2010)



Daniele Capasso

Daniele Capasso is Group Strategy Director at the Volvo Group. He draws on experience from industries including fashion and stainless steel. In his free time, the phone apps he uses most are Spotify and Whatsapp.



The economics of an electric switch

Future transport will run on electricity. The main transition will take place when the total cost of owning and operating an electric truck is lower than that of a diesel truck.

THIS YEAR, Volvo Trucks in Europe has started selling two fully electric trucks designed for transport and waste management in cities. Next year, sales of electric trucks will begin in the USA. Both Volvo Trucks and a number of other truck manufacturers have announced that, within the foreseeable future, they are also planning to launch electric trucks for long-distance transport. One of the reasons is the increasingly stringent carbon emission legislation, not least within the EU.

"This has stepped up the need to act quickly and drive developments throughout the industry," says Jessica Sandström, Head of Global Product Management at Volvo Trucks.

Provided that the charging infrastructure is in place, the main transition from diesel to electromobility will take place when the total cost of an electric truck is lower than that of a diesel truck.

When it comes to the business

model for electric trucks, Jessica Sandström does not think it will be that different from the current one. On the other hand, revenues and the dynamics for dealers will differ. The purchase price of an electric truck will be higher and, at the same time, the customer's operating and service costs will be lower.

The new technologies have also changed the rules of the game. Within the field of electromobility, there are a number of new players who are competing with the established truck manufacturers.

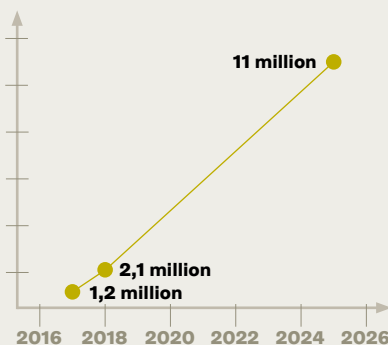
"These new companies enjoy many advantages as a result of being small and fast moving. At the same time, we know that it's difficult for them to scale up their volumes. This is an area in which we are best in the world. The knowledge we have amassed the last 90 years puts us in a really good position for the future. We are only at the start of these developments." ■

LINDA SWANBERG



Electric on the rise

For passenger cars, electromobility is quickly becoming mainstream. Overall, the sales of electric cars almost doubled between 2017 and 2018. By 2025, there will be 11 million electric passenger cars sold globally, according to estimates by Bloomberg New Energy Finance.



55%

The number of new passenger cars that will be electric by 2040, according to estimates by Bloomberg New Energy Finance.

Less maintenance

A conventional internal combustion drivetrain has around 200 moving parts, whereas in an electric engine there may be as few as 20. This means electric vehicles could have fewer part replacements and lower maintenance costs.

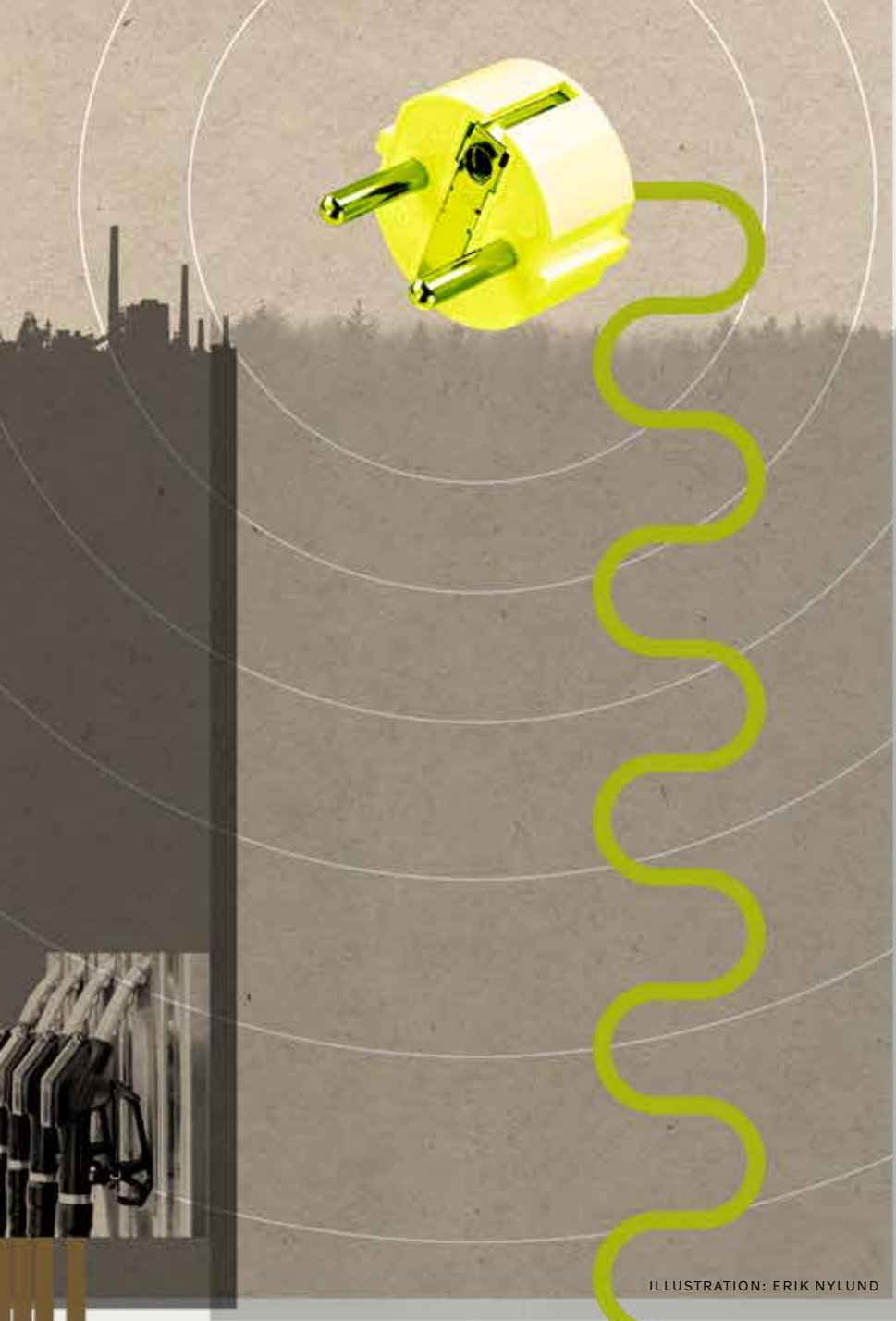


ILLUSTRATION: ERIK NYLUND

“Range anxiety” is creating new business opportunities

“IF THE DRIVER of a diesel vehicle sees that the tank is half full, he isn’t particularly worried. The driver expects there to be fuel stations for both diesel and petrol. Initially, this isn’t going to be the case for electric trucks and this is an area where we can see business potential. In the transitional stage, we will be able to offer our customers new service solutions, such as telling them where there are charging stations, calculating ranges, assisting with booking and making payments as straightforward as possible,” says Jessica Sandström.



Jessica Sandström

Jessica Sandström is Head of Global Product Management at Volvo Trucks. Her passion for electromobility started in 2005 when she was the CPM for the first hybrid driveline in the Volvo group. She prefers electric when it comes to both cars and bikes.

How will charging work?

“WELL, IT GOES without saying that a charging infrastructure for electric trucks is absolutely decisive. Right now, the system for cars is being developed at a fairly rapid pace, but this process has hardly started when it comes to commercial vehicles. This is going to be an area of enormous activity over the next few years and we are just one of many partners. But the Volvo Group and other truck manufacturers can’t be expected to assume total responsibility. Society also needs to contribute and initiatives are needed on a number of different levels. In 20 to 30 years, this will be a no-brainer,” says Jessica Sandström.

Three big drivers of electromobility

- 1 Regulators** – a growing number of governments globally have made commitments to limit vehicle emissions and cities are also moving to ban diesel vehicles in city centres in order to improve air quality.
- 2 Urbanisation** – 55 per cent of the world’s population live in cities. The quick pace of urbanisation is fuelling the need for less polluting vehicles in the world’s fast-expanding cities.
- 3 Retail** – retailers are set to benefit from both a green image and an efficient delivery system that allows vehicles to drive straight into a shop or warehouse and deliver late at night.



An autonomous future takes shape

Automation is changing what machines and vehicles look like. Developments in the construction and mining segments could show how.

WHEN IT COMES to the development of automation, the mining and construction sectors lead the way.

“While most road vehicles are still being tested at a demo stage, automated mines have been operating commercially for years,” says Johanna Huggare, Manager Intelligent Machine Platform at Volvo Construction Equipment.

So, what does that future look like? Johanna Huggare expects that the effects of increasing automation will be wide-ranging. For example, the mining and construction machines of the future will probably be smaller, more robust, highly specified and electric.

“Today, machines often carry out a wide range of applications and they are designed around the driver’s needs and comfort. In the future, I think we are going to see smaller, very

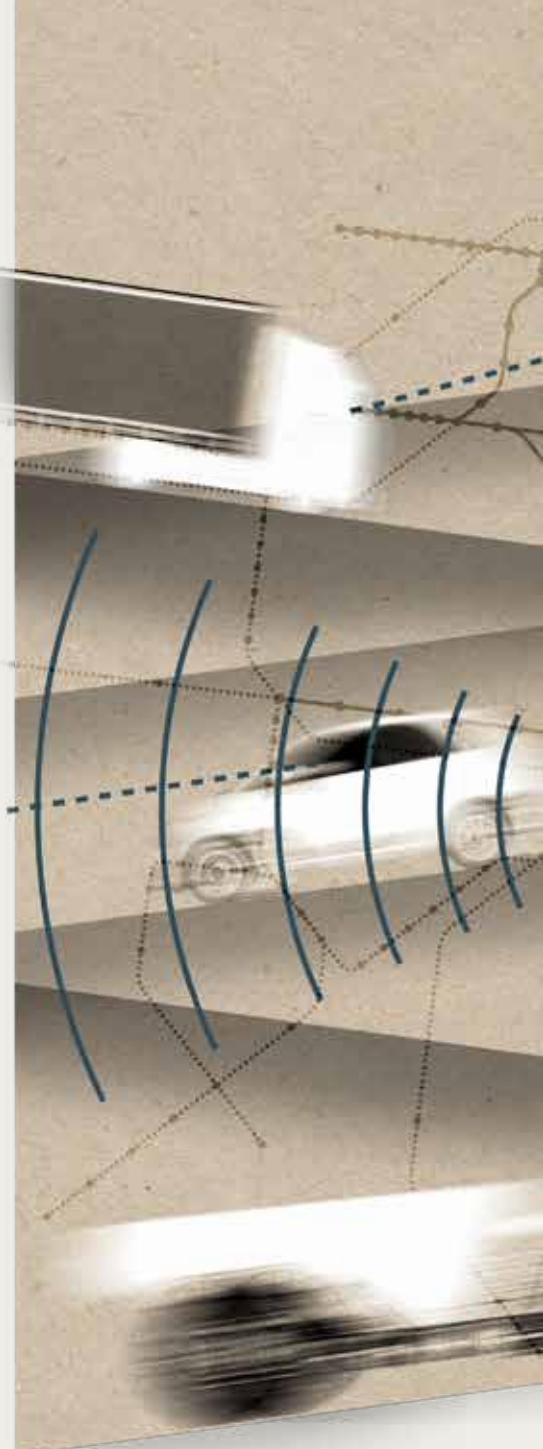
specialised models. Automation will also make electrification easier,” she says.

The gains could be very large, including better safety and greater productivity.

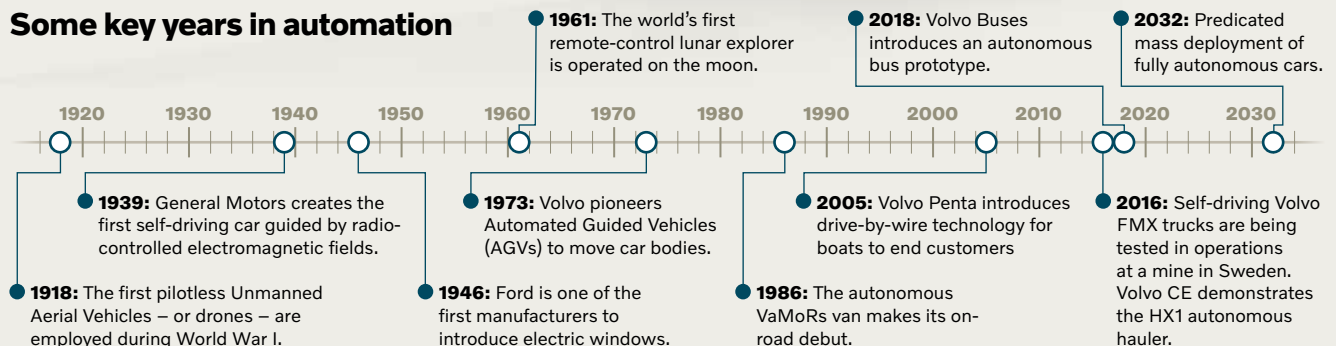
FOR EXAMPLE, automated vehicles would mean mines could be kept open even when there is a danger of debris or dangerous gases and the work can take place over a longer period.

However, due to the high speed of innovation, it is not always easy to know what route that innovation will take. Here, Johanna Huggare thinks that customer partnerships can play a crucial role: “Customers don’t always know themselves what they want, so that’s why it’s important that we work through tight-knit partnerships with them and explore it together.” ■

LINA TÖRNQUIST



Some key years in automation



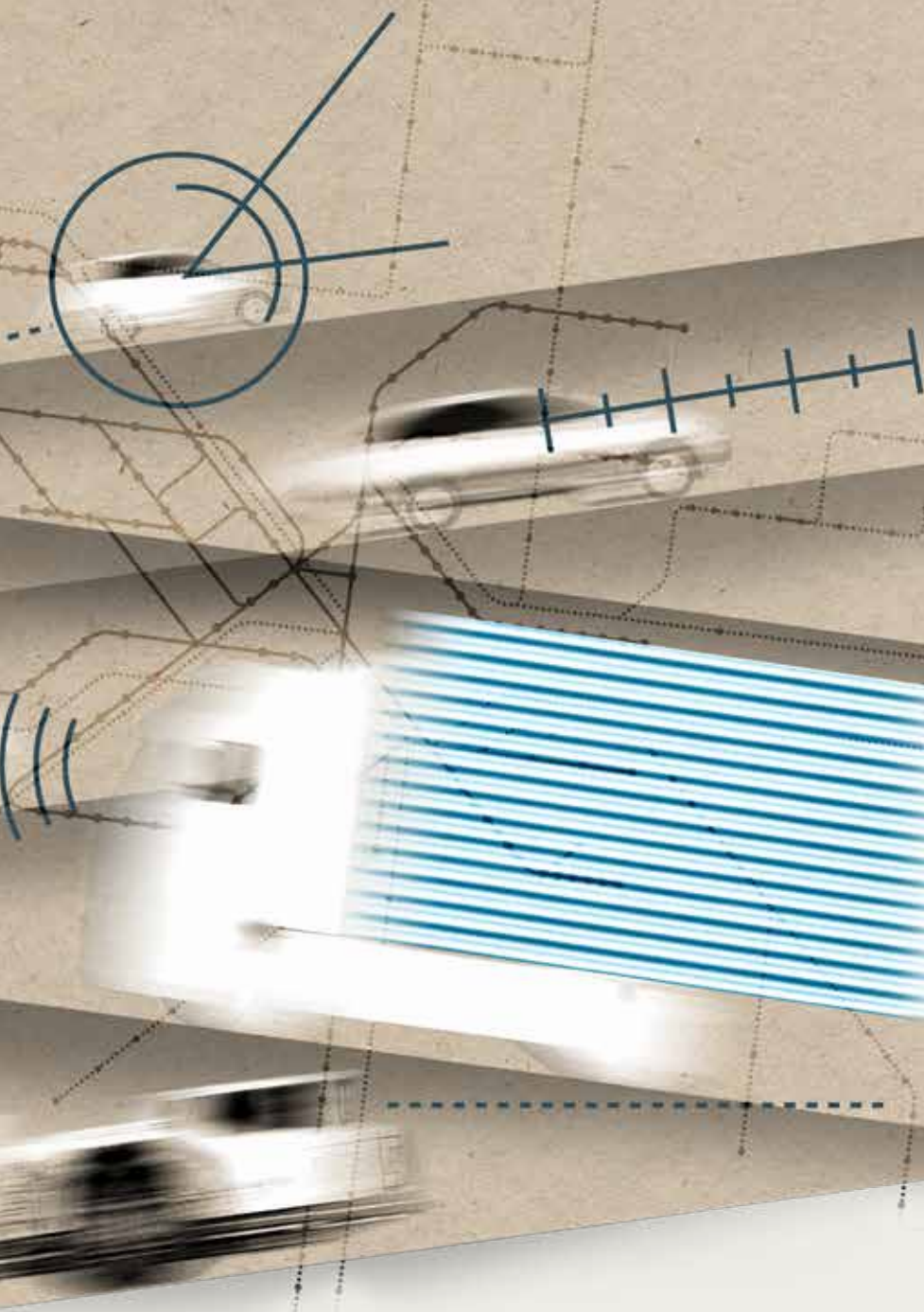


ILLUSTRATION: ERIK NYLUND

A race for the future of the car industry

WITH MAJOR TECH FIRMS in the game, a lot of innovation is taking place in the car industry. Here are three companies working on self-driving car technologies.

■ **Waymo** – Alphabet subsidiary Waymo started offering a commercial taxi service for driverless cars in Phoenix in December 2018.

■ **Volvo Cars** – has placed an emphasis on safety innovations. Is now using Nvidia's self-driving system for its new Level 2+ assisted driving vehicles, which integrates multiple AI technologies.

■ **Baidu** – Chinese tech firm Baidu runs an open platform called Apollo that lets third-party developers tap into its autonomous driving technology.

Could subscriptions pave the way?

SUBSCRIPTION MODELS have been a way to pay for music and films, which were previously sold as CDs and DVDs. Could the same model make sense for automated vehicles? "That's the key question we are exploring in the business right now," says Johanna Huggare, Manager Intelligent Machine Platform at Volvo CE.

Three advantages of automation

- ① **Safety** – by eliminating driver error and reducing the number of people being around vehicles or in dangerous environments, such as mines, safety can increase significantly.
- ② **Productivity** – work can be carried out more efficiently and over longer hours.
- ③ **Work life** – the type of work at sites is set to change and operators will be assigned more supervisory duties.



Johanna Huggare

Johanna Huggare is the Manager of Intelligent Machine Platform at Volvo Construction Equipment. Her favourite invention through the ages is the world's first computer algorithm, written by Ada Lovelace in 1843.

Ready for the 5G revolution

Eskilstuna in Sweden is home to the first industrial 5G network in Northern Europe. Now Volvo CE is using this new technology to test different remote-controlled machines and autonomous solutions.

TEXT MARCUS OLSSON PHOTO VOLVO CE



Calle Skillsäter is Technical Specialist Connected Machines at Volvo CE. Here he can be seen remote controlling a wheel loader at Volvo CE's site in Eskilstuna.

AS ONE STAGE in a deeper partnership with Telia and Ericsson, a local 5G mobile network has been created at the Volvo CE facility in Eskilstuna. A 5G mast – the first industrial 5G installation in Sweden – has been erected next to the test area at the plant.

“In concrete terms, this means that we can test this new technology at an extremely early stage – long before many others in our industry. Compared with when 5G technology becomes mainstream for the general public, we are many years ahead,” says Calle Skillsäter, Technical Specialist Connected Machines at Volvo CE.

Among other things, the technology is being used to test the remote control of machines and autonomous solutions.

“This is an area in which 5G makes a huge difference. Remote control requires high-quality video and the operator wants rapid response times with minimum delay. When you touch a lever or turn a steering wheel, you want something to happen at more or less the same moment,” explains Calle Skillsäter.

Compared with 4G, 5G is faster, more powerful and more reliable. 5G offers greater

“Volvo CE is a powerful Swedish player in a global industry.”

ANDREAS DAHLQVIST, PROJECT MANAGER FOR 5G AT TELIA

MORE POTENTIAL

► 5G enables so-called network slicing, which means that there is a certain segment in the network that can be allocated to a specific operation. For example you will not be affected by the fact that there are many other units, like mobile phones, in the area that cause disruptions and consume network capacity.



Andreas Dahlqvist

bandwidth, which enables the transfer of larger data volumes at a higher speed.

“We are talking gigabits a second rather than megabits,” says Calle Skillsäter.

One of the greatest benefits offered by this new technology is that it contributes to security and

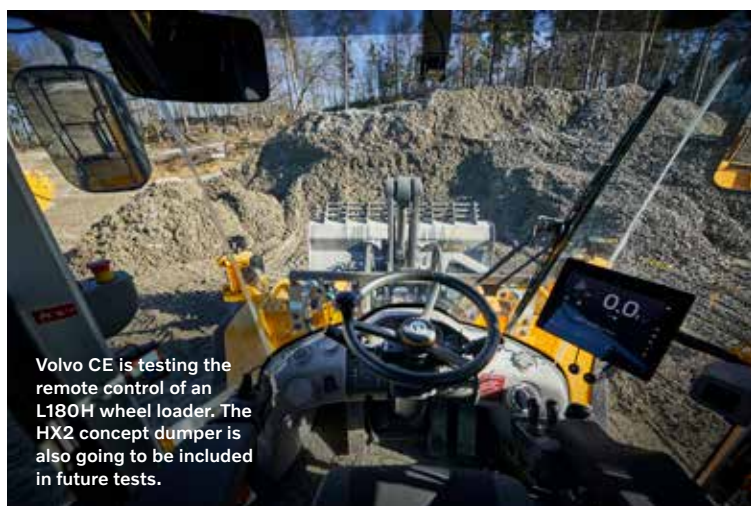
productivity at many workplaces. One example is mining where, following blasting, it can take several hours to ventilate an area. With remote-controlled vehicles and machines, operators can quickly return to work.

“Connected machines and autonomous systems are definitely the future. This technology is going to create enormous added value for customers, such as more efficient production and logistics, greater flexibility and increased safety,” says Calle Skillsäter.

Andreas Dahlqvist is the project manager for 5G at telecom company Telia and responsible for the collaboration with Volvo CE.

TOGETHER WITH A small number of other companies from the Nordic region, Volvo CE has been selected to participate in Telia’s two-year partnership programme for 5G development.

“The Telia 5G partnership programme is a new kind of partnership in which we work even more closely with our partners in their digital development. After all, Volvo CE is a powerful Swedish player in a global industry. It’s a company with an extremely strong digitalisation and development agenda. This partnership is giving us a new insight into the way this technology can be used and how we can join forces to help one another,” says Andreas Dahlqvist. ■



Volvo CE is testing the remote control of an L180H wheel loader. The HX2 concept dumper is also going to be included in future tests.

5 FACTS ABOUT 5G

5G could transform our lives. But with many of our smartphones currently running on 3G networks, 5G may seem a long way off. It is not. If you want to learn more, keep reading.

1 THE FIRST 'G' DATES BACK TO THE '80S

The first generation of network was released in the 1980s: it was analogue and could only carry voice. Then came 2G, which could carry both text and picture messages. The early 2000s saw the release of 3G, enabling features such as video calls. Another 10 years passed before the release of 4G, supporting mobile internet and the speeds needed for video streaming and gaming.

2 IT IS GOING TO BE SIGNIFICANTLY FASTER

It would take you more than a day to download a HD movie on 3G, at current capabilities. 4G cuts down that time to around seven minutes. But when you compare that with 5G – the difference is staggering. It will potentially take as little as four seconds to download with 5G.

3 IT GOES WAY BEYOND MOBILES

5G will obviously have major implications for mobile devices. But it is also expected to advance machine-based, IoT-centric (Internet of Things) functionalities, which include autonomous and connected machines.

4 THE STANDARDS HAVE BEEN SET

In June 2018 3GPP – the international wireless standards body – signed off on the finished 5G standard. Operators including Samsung and Nokia were involved in the consultation process.

5 ...BUT THERE IS STILL PLENTY OF WORK LEFT TO DO

From research to regulation, plenty of progress has been made on 5G. But it is still in its earliest stages of development. Now, it is up to the tech industry to build the hardware needed to support 5G.

Reaching the next level. Once the new 5G technology is fully implemented, users will enjoy a faster, more powerful and more reliable experience compared with 4G.

The factory of tomorrow

New technologies call for more flexible production sites and plenty of creative high-tech solutions. Group Trucks Operations (GTO) is exploring how the next industrial revolution will change the way of working.

ILLUSTRATION BRICKLAND



See the future now

Discover some of the features of a future factory in Augmented Reality. Download or update the app **Volvo Group AR Stories** and interact with the picture on the spread through your device.



“The only limit is our imagination”

The factory of the future is already here. Industry 4.0, the fourth industrial revolution, is transforming GTO. Through both local initiatives and larger global projects.

TEXT LOTTA BÄVMAN PHOTO PONTUS JOHANSSON

JAN OHLSSON, EVP Group Trucks Operations (GTO), anticipates big changes, when it comes to both technology and the way work will look for teams and individual employees.

“Right now, our imagination is the only thing setting the limits. New technologies are adding value and have enormous potential,” he says.

When most people hear about electromobility, connectivity and automation, the first thing that comes to mind are products, but, for Jan Ohlsson, they also refer to a digital, connected factory.

“These days, we no longer use print-outs, for example. Information for verification and decisions is available in apps or on dashboards. We have robotic colleagues in prep work on the line, autonomous fork-lifts in logistics and soft robots that can perform straightforward tasks at the office,” he says.

But this is not a radical overhaul – these changes are taking place step by step.

“Through VPS and work on continuous improvement, we are building our future workplace together. Everyone is included and can have an impact. What’s more, we are doing this cross-functionally. All the roles and areas

INDUSTRY 4.0

- The objective of Industry 4.0, the fourth industrial revolution, is to create a smart factory or plant at which everything in production is connected.
- The term was introduced in Germany in 2011.
- The first three industrial revolutions resulted from the rise of the steam engine, electricity and electronics.

of responsibility are taking part and are driving technology development.”

Jan Ohlsson compares GTO’s local pilot schemes with start-up companies. This includes the chance to test and learn: to close an initiative down if it does not work or implement it if it adds value.

“This is an entirely new culture and we aren’t used to this way of working. But developments are taking place at lightning speed, we are finding new opportunities every month and it’s better to divide the work into smaller projects.”

Right now, there is a whole raft of successful pilot schemes in operation. A simple app to follow the logistical flow of trailers, an AR app to check the status of a machine, maintenance from a distance using AR glasses and tests of robots that work side by side with operators, are just a few examples. At the same time, large global initiatives like a totally connected logistics flow from suppliers to the point of use in a plant are also in progress.

Jan Ohlsson stresses that employee skills will remain pivotal. “We need to strike a balance in the transfer of skills – this is the key to success,” he explains. “Old and new production technology will need to exist side by side for many years if we are to stay competitive.”

THERE IS A huge difference in the industrial systems that are used to produce trucks that are powered by diesel, electricity and perhaps other fuels. This is an area in which GTO needs to be flexible during a transitional period.

“It’s absolutely vital that those of us who are already employed move around, but we also need the addition of new employees, new technology



Jan Ohlsson discusses new technologies with Atieh Hanna, Research and Development Engineer, and Richard Hedman, Senior Research and Development Engineer at GTO Quality & Engineering, at CampX.

and new ways of working. We can also improve our skills and expertise by collaborating on technology with companies and universities in different areas and locations globally.”

What does a GTO factory of the future look like?

“It’s a creative, future-oriented workplace in an ultra-modern company that uses high-tech, smart systems. I’m absolutely sure this will improve our attractiveness as an employer,” says Jan Ohlsson, who is himself genuinely interested in new technology.

“I’m installing a digital voice assistant at home. It’s really fun to interact with new technology both at home and at work!” ■



Jan Ohlsson at the Innovation Lab at CampX in Gothenburg. Here, GTO will build a model of a smart factory to test new technologies and solutions.



Keeping track of logistics



Volvo Group is working on a number of new solutions that will help with the monitoring and planning of material flows.

Data is going to play a decisive role in future logistics. The Volvo Group is currently testing a new solution that could change transport flows into plants.

EVERY DAY, as many as 4,000 orders are sent by the 3,000 material suppliers in different parts of the world who supply GTO. This corresponds to some 2,000 consignments.

"A large amount of the communication associated with deviations still takes place via email and phone. An overview to determine

what the trucks transporting material to plants are actually carrying, for example, is lacking. That's inefficient," says Johan Berntsson, Senior Project Manager for One Information Chain at GTO.

THE PROJECT BEGAN in 2018 with tests of a so-called Digital Experience Platform. Twenty specially selected material suppliers linked to the plant in Ghent in Belgium are participating.

"We want to ensure the right information at the right time in order to make the right decisions. To integrate people, processes, technology and partners in the same ecosystem, the supply chain needs to be transformed digitally," explains Johan Berntsson.

Using a number of new apps that are currently being developed, deviations can be followed when it comes to lost goods, delays or material shortages. Production planning and the forecasting of material flows can also be simplified by improving access to information.

"This is just one example of the way we are developing future logistics at GTO by using data in a completely new way. The data have been available for a long time, but it's now a question of removing system limits and collecting and visualising things to make it easier for us to make accurate decisions from both an operative and a strategic perspective." ■

MARCUS OLSSON

Co-bots making life easier for operators

IN THE ASSEMBLY PLANT of the future, collaborative robots, so-called co-bots, will work alongside operators. This will allow the Volvo Group to produce even more vehicle variants in its plants – without cutting efficiency.

“New technologies increase demands for flexibility. We aren’t going to build a new line for each vehicle type. Instead, we are going to have to make the best possible use of the plants we already have,” says Per-Lage Götvald, Senior Research Engineer at GTO.

He sees many advantages when it comes to robots and operators working together. When a large variety of vehicles are going to be produced on the same line, this could mean, for example, that one station has higher than 100 per cent utilisation, while another has far less.

“Instead of making employees

run between stations or sit and wait, robots can help to balance the peaks. Using Artificial Intelligence (AI), a robot can also learn many complex procedures, which makes life easier for the operators,” he says.

TO DEAL WITH the challenges posed by the flexible plants of the future, Per-Lage Götvald and his colleagues are collaborating closely with specially selected universities. Developments are taking place rapidly and co-bots are already being tested at some plants.

“The trials we have run are extremely promising. Our vision is to create a flexible, efficient plant in which people and robots work together on the same terms. This will also ensure that we have satisfied colleagues and are seen as an attractive employer,” he says. ■

LINDA SWANBERG



The smart glasses can save both time and resources.

Connecting people for support

REMOTE SUPPORT is an ongoing pilot project at GTO’s plant in Ghent, Belgium, as part of exploring new immersive tools. In short, an operator at the plant, for example, can wear smart glasses while a support operator can follow a live stream from the camera in the glasses at a different location.

“We’ve let engineers in the Tuve Plant put them on to demonstrate and explain how a product works for colleagues in Ghent,” says Jonathan De La Marche, Production Engineer at GTO.

The smart glasses can be used for maintenance work, repairs and training. But the idea is not to replace personal meetings in full.

“This is a complement. It is cost effective and time saving. Where we have previously had to fly in 20 people from Ghent to Gothenburg for a product display, we will instead be able to display products and processes remotely on a large screen. The glasses cost about as much as a single flight ticket,” says Jonathan De La Marche. ■

MARCUS OLSSON

PHOTO: NICOLAS DARTAILH



Patrick Marenthier is a Maintenance Team Leader at the Vénissieux engine plant in France. He has participated in tests with collaborative robots.

FINDING THE BALANCE

Xavier Delacour and his colleagues at Group Trucks Technology (GTT) are tasked with working out what future engines might look like. It calls for a flexible mindset.

TEXT LINA TÖRNQUIST PHOTO PER WAHLBERG

THERE IS NO magic bullet. To meet strict new emission standards in place in Europe and elsewhere by 2025, carbon emissions in new diesel vehicles need to be reduced significantly. But, after decades of work to calibrate engines for maximum efficiency, there is no quick fix.



Xavier Delacour

Instead, making headway is a process of fine-tuning technologies and designs: "It's often a question of making small gains, each one is perhaps only a fraction of a per cent, but it all adds up," says Xavier Delacour, Project Leader.

He and his colleagues are working on the early stages of new engine development. Through tight testing loops, they assess the technologies that have the most potential. Promising engine technologies are developed before being handed over for concept selection and industrialisation.



7.07 am

Early morning surf session. Xavier Delacour heads out to surf or paddle board whenever his schedule allows, often early in the morning. The sport requires dedication. "You might have to make ten attempts for each good wave you catch. Surfing is very meditative – it flushes out the brain."

PHOTO: MATHIEU TURRIES

What does it take to do this type of work?

"For one, you can't be too rigid in your thinking. You have to be open to trying lots of different approaches."

XAVIER DELACOUR MOVED from France to Sweden 11 years ago. One reason he has decided to pursue his career as an engineer in the country is the high degree of autonomy in the workplace.

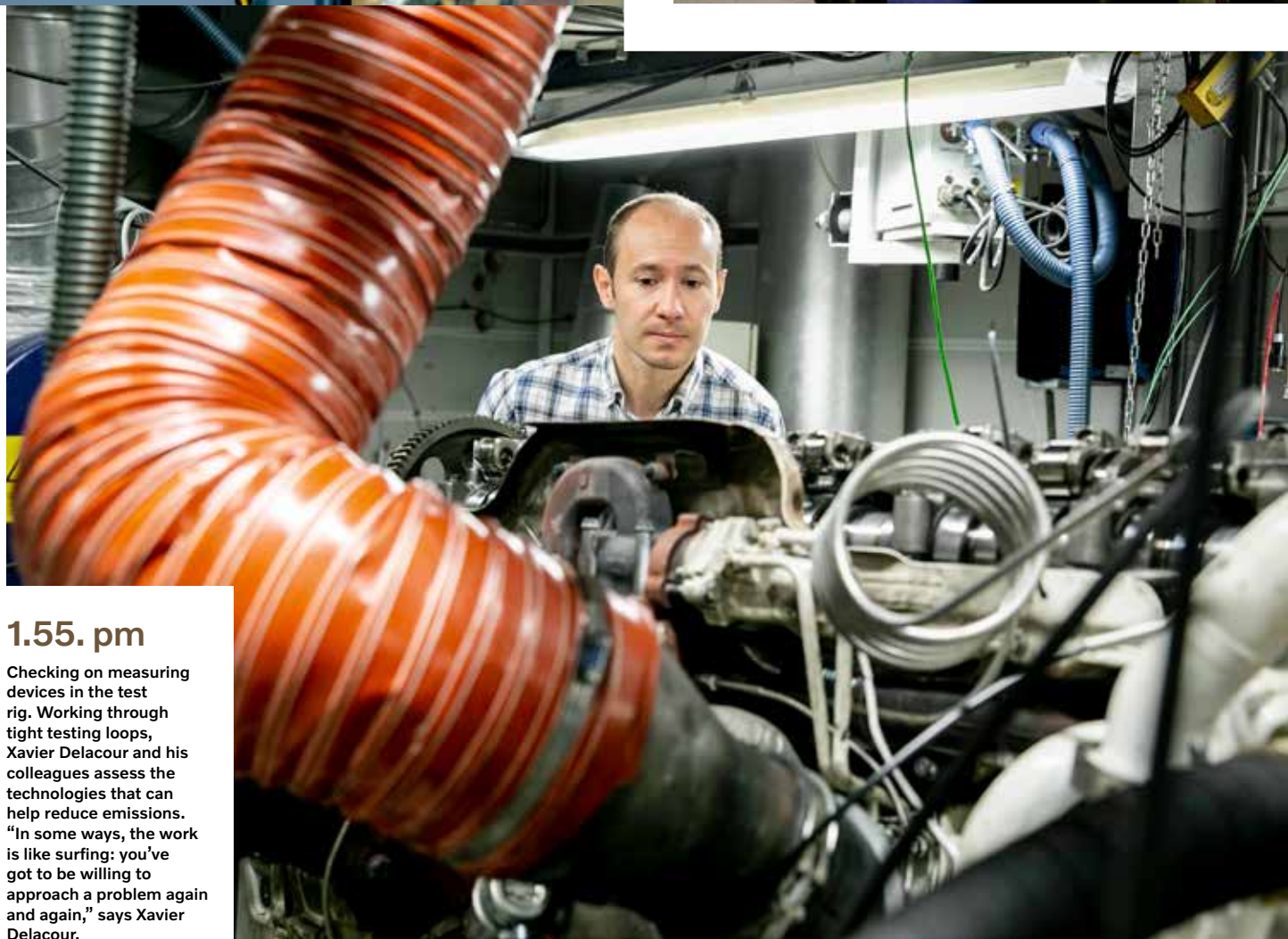
"I'm expected to be productive and get my work done, but I can influence how best to structure my time," he says.

"The work-life balance that is possible in the Volvo Group is a major reason why I've chosen to stay," he says. ■



8.55 am

Discussing simulation data at a weekly follow-up meeting. The meeting gathers engineers from different area of expertise to review simulations and test results. "Getting everyone together to meet face to face is much more efficient than email. It gives momentum to the work and allows us to move forward quickly."



1.55. pm

Checking on measuring devices in the test rig. Working through tight testing loops, Xavier Delacour and his colleagues assess the technologies that can help reduce emissions. "In some ways, the work is like surfing: you've got to be willing to approach a problem again and again," says Xavier Delacour.



10.45 am

Fine-tuning and preparing the engine test program, together with Fredrik Holst, Test Engineer, and Tobias Olsson, Rig Technician. "We are chasing every tenth of a percent in fuel savings," says Xavier Delacour.



12.22 pm

Lunch with colleagues. On Fridays, Xavier Delacour and his colleagues often head out of the office to eat lunch together. This week, they are going for pizza in Eriksberg, a ten-minute walk from the office.



2.15 pm

Xavier Delacour looks through a pallet filled with parts and discusses how they should be mounted, together with Anders Engström, Technician, and Fredrik Holst. As new parts are delivered, the test engines need to be rebuilt and fitted with measuring devices."

5 FACTS ABOUT THE EU'S NEW CO₂ EMISSION STANDARDS

Last February, the EU decided to implement its first ever CO₂ emission standards for heavy-duty vehicles, which is set to have a major impact on the Volvo Group and all other manufacturers.

1 According to the new regulations, by 2025, the average CO₂ emissions from a new heavy-duty truck must be at least 15 per cent lower compared with a new truck produced in 2019. This is a target the EU believes can be achieved with existing technologies.

2 By 2030, emissions should be at least 30 per cent lower. However, this will be reviewed in 2022 and will take account to any new developments or technologies that might affect this target.

3 According to the EU, almost six per cent of its total greenhouse gas emissions come from heavy-duty traffic. It is estimated that, between 2020 and 2030, the new standards could reduce these emissions by around 54 million tonnes – the equivalent of Sweden's total annual emissions.

4 The new emissions standards are based on the mandatory CO₂ declarations that were introduced on 1 January 2019, which stipulate that all new trucks must come with certified CO₂ and fuel consumption data.

5 Any manufacturer who fails to comply with the new emission standards will be heavily fined. The Volvo Group works to meet the new targets by further improving the efficiency of its combustion engines and drivelines, as well as improving aerodynamics and rolling resistance. The continued development of hybrid and electric solutions will also be an important part of its strategy.



NEW SMART SOLUTIONS

Technology and collaboration enable new solutions for the benefit of customers and the Volvo Group.

Learn about four innovative concepts. ➡

Support with a local twist

Based on customer input, Renault Trucks decided to offer a maintenance contract with a local twist. Through the Excellence Predict solution, a customer's local dealership is responsible for tracking truck maintenance needs remotely.

TEXT LINA TÖRNQUIST PHOTO DENIS CHAUSSENDE

HOW DO YOU design a whole new maintenance contract? One way is to let customers help design it.

Once Renault Trucks decided to create a diagnostic uptime service solution, the team started to involve its customers in the design process early on. In all, over thirty customers were brought into the early stages of the development process. "We discussed our plans with them and asked how we could help meet their needs. What they told us was that they were feeling slightly overwhelmed from interpreting data from their vehicles and having to make decisions at the spur of the moment," says Laurent Javey, Vice President of Aftersales France for Renault Trucks.

Customers told Renault Trucks that they needed support to simplify decisions and to act on the technical data they were receiving.

"In terms of the local French market, they also told us clearly that they wanted information and support directly from someone they know. That's why we decided to construct this

solution through local dealerships in France," says Laurent Javey.

The new solution uses remote uptime diagnostics to run tests on key components, including the transmission, batteries and the exhaust fans. It is also possible for dealerships to track the distance a truck has driven, the road surface and the conditions it operates in.

By continuously scanning key components, the system can predict whether a component needs

maintenance. If a key component is about to fail, a representative from the dealership gets in touch with the customer to ensure that the customer is informed and that the truck reaches a workshop ahead of any disruption.

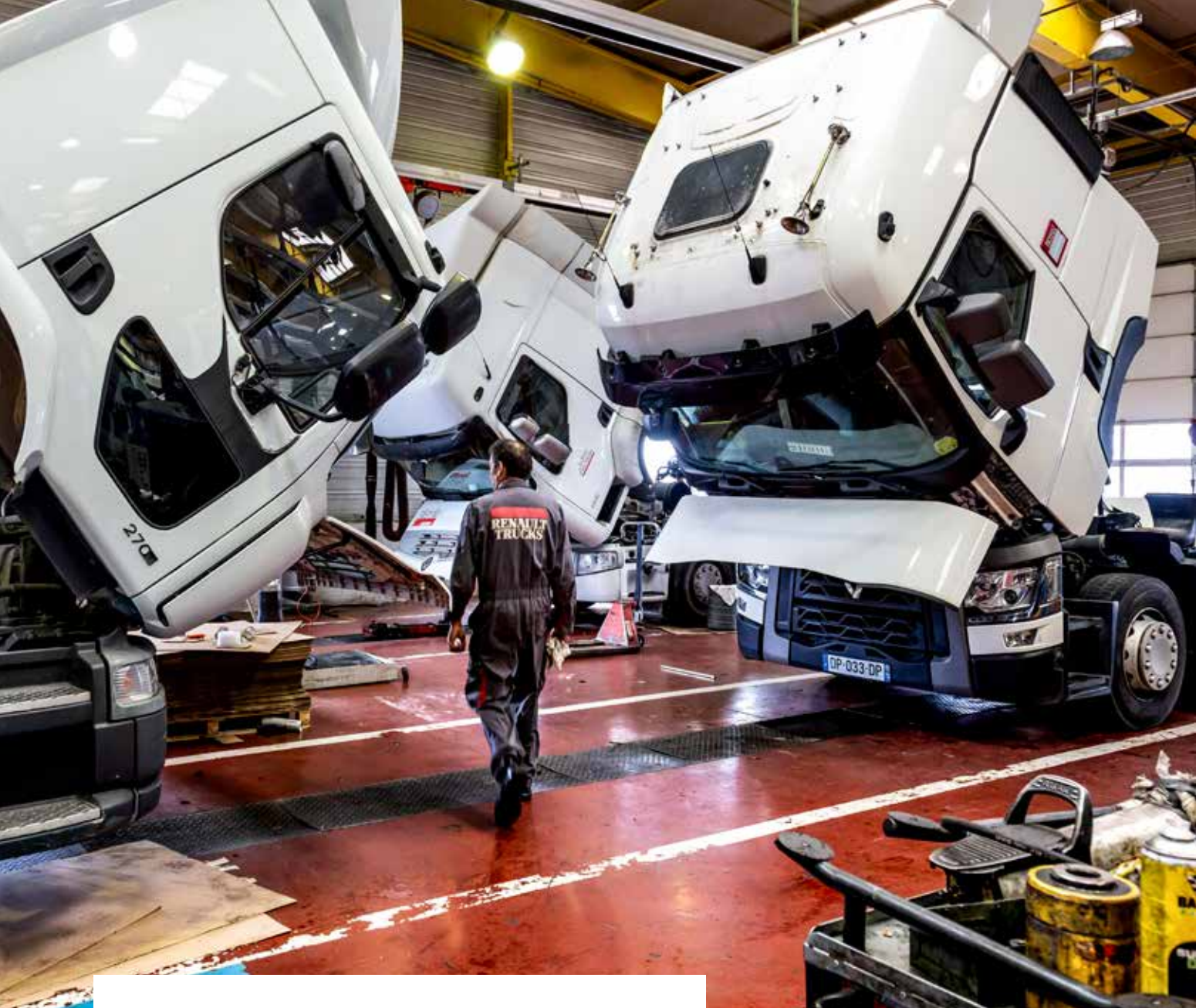
"The idea is for the dealership to take full responsibility for maintenance in order to avoid breakdowns and to resolve any issues as they arise and to ensure that the trucks are out on the road," says Laurent Javey.

Early on, the Renault Trucks' team benchmarked the Uptime Center in Greensboro and were also given a lot of technical support through the team at Connected Services. This helped

NEW SOLUTION NO.
1
NAME Excellence Predict
WHAT IS IT? A maintenance contract, in which responsibility for fleet maintenance and the uptime is outsourced, either to a customer's local dealership or to Renault Trucks centrally.
WHAT'S IN IT FOR THE CUSTOMER? Optimisation of total cost of ownership. Peace of mind.



Since launching Excellence Predict in early 2019, more than 30 local dealerships across France have signed on, including this dealer in Lyon, France. In some other markets, uptime services are handled centrally.



Sylvain Bacholas at a Renault Trucks dealership in Lyon, talks to a customer to ensure that his truck reaches a workshop ahead of any disruption.



Laurent Javey

speed up the development process. It was also supported by working in iterative, testing loops: one dealership and one scenario at a time. "Making sure that we really took the time to test things out by working in sprints has proved very successful," says Laurent Javey.

One big plus to involving customers early on was that, once the team presented the solutions, many of the customers were already on board, says Laurent Javey. "They had been with us since the beginning and knew what they could expect".

Since launching in early 2019, more than 30 dealerships across France have signed on. ▶



Pierre Sirolli

In markets outside of France, the Renault Trucks' team started out by trialling the new contracts with customers in the Czech Republic and then quickly made the decision to expand to other markets.

Pierre Sirolli, Vice President of Service Market, explains:

"Right away, we could see that our customers really liked it, so we pushed as hard as we could to get going in our other markets as soon as possible".

EXCELLENCE PREDICT HAS now been launched in markets across Europe including the Czech Republic, Romania, Bulgaria, Slovenia, Poland and Spain. Outside France, the exact set-up and management of the contract depends on the dealer network and ownership structure in each country. In some countries, the service is managed centrally and in others directly by local dealerships. "We've taken a market-by-market approach," says Pierre Sirolli. "Markets get to choose whether they opt in and then we design a structure that is best suited to them."

Response from customers has been almost universally positive. "For the image of Renault Trucks, it's had an incredible effect," says Pierre Sirolli. "I also think this type of service agreement is vital to Renault Trucks in its next steps towards electromobility solutions. In that phase, service contracts like this one will play an even bigger role." ■



Gilles Galland, Diagnostic Specialist, inspects a truck at Renault Trucks' Corbas workshop in Lyon.

Finding new ways to pay

It is often best to solve a big problem by breaking it into smaller, more manageable parts. That is what Volvo Financial Services iLab is doing as it builds a new payment platform for Volvo Group's customers.

WHEN THE VFS ILAB TEAM was tasked with building a payment platform for Volvo

Group customers, the team did not try to solve the entire problem right away. Instead it worked with colleagues from the brand organisations to identify customer pain points at different Group locations and developed a list of use cases. They included digitising payments for parts sales for Volvo Trucks Norway. The team then tried to solve these payment issues through 90-day proof of concept sprints.

"There is so much innovation within this area that, by trying to solve the entire system at once, we risked ending up with a legacy infrastructure by the time we were finished. And that's something we definitely wanted to avoid," says Allen Atchley, VP Strategy and Innovation and head of VFS iLab. "But, by breaking the problem into different component parts, we've been able to work faster and with a smaller group of stakeholders. The bigger issues then often get solved as we go."

AT THE SAME TIME that VFS is developing a payment infrastructure by solving issues customers are facing today, the team is also actively looking down the road at possible disruptive payment technologies, such as blockchain. To do so, the team has been partnering with external start-up partners



A blockchain is a decentralised, distributed and public digital ledger. It is used to record transactions across many computers so that any involved record cannot be altered retroactively, without the alteration of all subsequent blocks.

NEW SOLUTION NO.

2

NAME

Volvo Pay (internal project name)

WHAT IS IT?

A customer payment platform for the whole Volvo Group.

WHAT'S IN IT FOR THE CUSTOMER?

Flexibility of payment options and ease of use.



Allen Atchley

that are focused on disrupting payment infrastructure. "We want to be working alongside them to work out what they see as weaknesses to exploit in the existing payment infrastructure. For example, we need

to look at how payment systems will have changed three years from now. And could these be the right partners to work on the next generation of payment solutions?" says Allen Atchley.

TO AVOID HAVING the same payment-related issues being worked on by dozens of teams across the Group, iLab is aiming to make VFS a centre of excellence when it comes to payments. It also hopes to eventually become the central payment solution provider for Volvo Group's customers.

For customers, the payment platform now under way would mean more payment options and ease of use. While for the Volvo Group, a smart digital payment infrastructure that stays up to date as the global payment system evolves, could save both time and money. ■

LINA TÖRNQUIST





Room for more. Niklas Seger at the Volvo Group wants more Android developers to add to his team of 75 specialists.

Through cutting-edge Android development work, the Volvo Group is investing heavily in connected services and the entertainment systems of tomorrow. This will give customers improved services and future-proof technology.

TEXT MARCUS OLSSON PHOTO ANNA SIGVARDSSON

Driving Android development

THE PLATFORM FOR entertainment and connected services in Volvo Group's trucks uses the Android operating system. There are just a few specially selected companies with direct access to new versions of Android long before they are launched on the open market and the Volvo Group is one of them.

"This gives us enormous opportunities when we develop new services and applications for the entertainment system. As things stand, developments are taking place at lightning speed and our team really is working at the forefront," says Niklas Seger, Global Technology Manager for Entertainment and Connected Services at Volvo Group Trucks Technology.

Android is being developed by Google, which has built the operating system on open source codes. This lets developers create their own versions of operating systems and apps.

"There are other operating systems that are completely closed and where the same opportunities don't exist. For the Volvo Group, the selection of Android as a platform means that 'anyone at all' can help us

with apps that function in our trucks. We can use apps from our business partners and third-party suppliers," says Niklas Seger.

JOAB, for example, has already created an app to operate hooklifts or load exchangers, which can be used on Volvo trucks. Other examples include apps for logistics or navigation that other companies develop and can be integrated into Volvo Group trucks' systems.

NIKLAS SEGER'S 75 closest colleagues are experts in everything from automotive electronics to user interfaces, software development and system architecture. Different teams are responsible for different products in trucks, such as media players, phones and connections to the Dynafleet transport system.

"I think some people will be surprised when I say that what we are involved in is cutting-edge technology, as their traditional picture of us is that of a company that 'only' produces vehicles. When we recruit new colleagues, we focus on making more people see us as a company that is working intensively on software development and more specifically with Android."

Another challenge is the fact that the development of electronic hardware has traditionally taken too long compared with software development.

"It can take several years to develop a new truck. The cycles have been so long that the hardware is already outdated before it's

NEW SOLUTION NO.
3
NAME Android development
WHAT IS IT? The Volvo Group's specialists are at the cutting edge with this new technology.
WHAT'S IN IT FOR THE CUSTOMER? Future-assured technology and improved services and apps in trucks.



Plug and play. One of the developers got an idea to install the popular game *Angry Birds* in one of the trucks. "We can do a lot of fun stuff," says Niklas Seger at the Volvo Group.

even launched. So the challenge for us is to future-proof everything associated with the entertainment system wherever possible. We need hardware that is able to manage software upgrades that we want to include – in this case, specifically Android. The performance of processors, internal memories and storage space must be compatible at a later stage."

Niklas Seger compares the situation with a mobile phone where the consumers always make sure they have the right hardware to support updates needed for the phone to continue working.

"It's easy to replace a phone and mirror its content against the cloud in order to transfer your files to your new phone. One decisive difference for us at Volvo Group is that a truck costs much more than a mobile phone and you don't replace it just like that..."

TO REMAIN AT the forefront, the Volvo Group has chosen to invest in its own organisation which is tasked with software development.

"We want a short time to market. We are unique in that we have chosen to insource and do most of the work ourselves. It's my vision to have a team where the members are experts in their specific field, so that we can support anyone within the Volvo Group that is introducing a new product. We are going to be world champions at what we do and we don't need to do everything from scratch every time," says Niklas Seger. ■

Updates made easy

Remote Software Download is a new function and service from Volvo Trucks in Europe. It is exactly what it sounds like: a remote way of updating truck software.



Mats Andersson

WHEN THE software in a truck needs updating, the driver does not need to drive to a workshop and this saves a lot of time.

Remote Software Download (RSWDL) sends a notification to the dashboard display telling the driver when new software is available for installation. All the driver needs to do the next time the vehicle is parked in an appropriate place, is to put the key in the designated position and activate the update in the menu system on the display.

"The driver and the haulage company don't need to make an appointment with a technician at a Volvo dealership – everything is done automatically. An update takes between a couple of minutes and a maximum of one hour. In other words, it can be done when the driver takes a break from driving," explains Mats Andersson, Service Owner.

RSWDL is already an existing offer for Volvo Group Trucks in North America, and Europe now follows. Since 2017, pilot projects have been run in Finland, Lithuania and Switzerland involving the Volvo FM and FH models.

"In one of the pilot projects, a logistics company wanted to update its fleet of vehicles with a software kit for saving fuel. You could say that it was like 'tuning' the truck to make driving

NEW SOLUTION NO.
4
NAME Remote Software Download
WHAT IS IT? The remote update of the software in a truck electronic control unit.
WHAT'S IN IT FOR THE CUSTOMER? Increased uptime in the customer's transport operations.

1 When an update is available, it is transmitted using the Features Online application via the cloud to the TGW (Telematic Gateway), an electronic control unit, in the truck.



7 When the update has been completed in the truck, information is sent to and stored in Volvos central systems.

2 When the truck receives information about the new software update the message "SW update required within 28 days" appears on the dashboard display. The display is able to show messages in 23 different languages.

3 In order to accept and implement the update, the truck has to be parked, with the engine turned off and the key in the designated position.

4 The driver then activates the update using the menu system on the display.

5 When the update has been activated, the new software version is collected from the TGW.



6 Once the update has been installed, the message "SW was successfully installed. Truck is ready to drive" appears on the display.



more cost effective. We updated the trucks with a maximum limit for cruise control and optimised the vehicles for driving in hilly terrain to adapt them to the company's operations. The customer's reactions to the benefits have been really positive," says Mats Andersson.

"This system offers nothing but advantages. It increases efficiency both at workshops and for

drivers on the road. It can generate substantial cost savings. It also shows that Volvo Trucks is at the cutting edge when it comes to the development of our products and services. In the future, it will be possible to connect RSWDL with diagnostics in order to avoid unplanned stops, keeping our customers in operations for longer." ■

MARCUS OLSSON

9.06 am

Ageo, Japan

MASAHIRO TAKAHASHI, Hiroyuki Kasai and Akira Takeuchi from the Kaizen team at the Ageo Plant, are taking a look at their new collaboration site. It is one of the initiatives within Intelligent Digital Workplace (IDW) that is now being rolled out in the Volvo Group.

The online Kaizen working community is accessed through company PCs and own devices, enabling cross-functional work and interaction with other colleagues like hosting discussions and posting questions and ideas.

"With this collaboration site, we are adding valuable new functionality for our team and other colleagues," says Yoshifumi Takada, responsible for vehicle production in the Ageo Plant.

He has been working directly with project leader, Penda Song, and communication manager, Erina Yamaoka, to design the site.

The pilot will be evaluated at the end of the year. A second similar pilot at UD Trucks Japan Sales is already on its way. It will connect service technicians via a collaboration site for improved networking and knowledge transfer. ■





PHOTO: JUN TAKAGI

ROGER ALM, PRESIDENT OF VOLVO TRUCKS

“I want us to have an entrepreneur’s mindset”

The customer has always been central for Roger Alm, President of Volvo Trucks. With 30 years’ experience behind him, he talks about the importance of understanding customers’ needs and adapting the business to match them.

TEXT SUSANNE HANSSEN PHOTO PATRIK OLSSON

ROGER ALM’S INTEREST in trucks, especially those from Volvo, started at an early age. His neighbour in Vetlanda, in south-eastern Sweden, was a Volvo dealer and it was there that he became inspired by the quality of the products and the strength of the brand. Roger Alm’s first job was in product development at Volvo Trucks’ special vehicle unit. He then went on to work in the service market.

What does working in the service market mean today?

“It’s hugely important. Service has always been and will continue to be extremely important for the whole of our operations and business. Through service, we help customers to get their trucks back on the road. It’s where we build important relationships and create trust. It’s been a lot of fun to help out as a technician

ROGER ALM

Born: in 1962 in Vetlanda

Education: certified upper secondary school engineer

Leisure time: Roger Alm enjoys playing golf and spending time with the family. He likes skiing and has taken part in the annual cross-country ski race Vasaloppet.

at workshops from time to time. I have even worked alongside the winners of our competition for workshop technicians, VISTA.”

How was that?

“It was rewarding and I learned a lot. Today, the work that is done by technicians is really advanced; it combines a great deal of technology and a demanding work environment where they offer our customers round-the-clock service. By joining them, I want to show my appreciation for the work they do.”

You have also tried your hand as a truck driver, haven’t you?

“Yes, I did that when I was working in Brazil. I sometimes borrowed a truck for the weekend and drove off in it. I lived in the cab and was able to experience our products out on the road. This is also important as a way to understand our customers and their needs. I would happily do it again.”

Service has always been extremely important for Volvo Trucks. Roger Alm likes to help out at workshops from time to time. "It's where we build important relationships and create trust," he says.



"The customer should always be in focus and we need to be involved in developing our customers' business."

ROGER ALM, PRESIDENT OF VOLVO TRUCKS

You have spent a total of 12 years working abroad. What have you learned from this?

"How important it is to adapt leadership to suit different countries and different cultures. The customer should always be in focus and we need to be involved in developing our customers' business. I have worked in Australia, Poland, Slovenia/Croatia and Brazil and the way to sell trucks varies from one country to the next. Customers are also different. So, if we are going to be successful on a market, we need to understand what applies there and create strong relationships with our customers. At the same time, it's important to establish the Volvo Group's culture and values in our work with customers so they understand exactly what we represent."

In your view, what makes for good leadership?

"Leadership and culture are strongly linked. I really believe in empowerment. Good leadership is a question of trust and getting other people to act. But we must take responsibility for delivering what we have agreed to. I want us to have an entrepreneur's mindset."

"Good leadership creates an open, honest, clearly defined culture. This gives us employees who are engaged and prepared to take responsibility, who feel that they are making a contribution. I prefer straightforward speedy ways of working."

"We need to focus on being 'One team – One direction', always with the customer's needs in mind."

Are you that kind of leader?

"You need to ask other people that question! But I hope so. I try to be myself, listen to other people and have no thoughts of prestige."

What should Volvo Group employees feel when they go to work?

"That it's fun to go to work. They should go home on Friday for a much-deserved rest after a

good week and return on Monday feeling happy. I want them to feel involved and that they are part of the big picture."

How important is collaboration within the Volvo Group?

"Incredibly important. GTO builds our trucks, GTT develops the technology, GTP is responsible for important purchases and VFS supports our customers with financial solutions. I hope we can strengthen our partnership and our relationships even further. This is extremely important for our success to continue. Together with Volvo CE, we are also able to offer our customers a complete solution, with several different types of product, which is totally unique in our industry. We need to keep taking advantage of this."

Which future challenges do you see?

"During the past few years, we have experienced good growth and development in all our markets. It's important for us to be prepared in order to manage changes that can occur without much warning. We will always be able to sell trucks, but we need to develop business models and make sure that we are able to adapt our size to match new conditions. We also need to continue to deliver high-quality products and help our customers achieve profitability with their Volvo trucks."

"What's more, we need an effective product plan that is able to match the increasingly high demands that are made by our customers and the world around us."

Roger Alm's career at Volvo Trucks

2004–2010 Responsible for Volvo Trucks Eastern European Region, **2010–2011** President of Volvo Trucks Latin America, **2012–2014** President of Volvo Group Trucks Latin America, **2015–2016** Senior Vice President Volvo Group Trucks Northern Europe, **2016–2018** Senior Vice President Volvo Trucks Europe, **2019** President of Volvo Trucks and a member of the Volvo Group's Executive Board since January





Roger Alm participating in a film production ahead of this year's VISTA competition. His first job was in product development at Volvo Trucks' special vehicle unit and he has a great deal of experience from different markets.

Could you explain what you mean?

"Well, one example is the more rigorous legislation within the EU when it comes to carbon emissions. We have to adapt ourselves and our products to comply with it. But I'm not worried. We hold a powerful, leading position when it comes to new technology within electromobility and automation. At the same time, the development of the diesel engine continues."

You were there when the first electric truck was handed over to a customer. What was that like?

"It was fantastic! I'm proud of what we have

achieved and what it means to all of us working at the Volvo Group. It's also great to see that Vera, our first fully autonomous, electric and connected transport solution, has created so much buzz. And more new and exciting products are in the pipeline."

What is it like being a member of the Volvo Group's Executive Board?

"It's an honour and it's touching. I've been working here for 30 years and it's a great honour to help lead this fantastic company. I have really looked forward to this." ■



The paintshop is one part of the plant in Blainville with the highest energy consumption. Every day, 280 cabs from Renault Trucks and Volvo Trucks are painted here.



The Volvo Group is working hard to minimise its environmental footprint. Since 1 January 2019, all facilities, operations and plants in France, Sweden, Belgium, and the main sites in the US, have been sourcing renewable electricity.

TEXT LINDA SWANBERG PHOTO DAVID ARRÁEZ

EVERY COLOUR IS **GREEN**



Every year, the plant in Blainville purchases around 30,000 megawatt hours of electricity. Julie Michel, Environmental Manager at Group Trucks Operations, and her colleagues are working to find energy-saving actions.

B LAINVILLE IN NORTH-WESTERN France is home to a Volvo Group plant with around 2,000 employees. The work includes welding, treating, painting and assembling cabs and medium-duty trucks for Renault Trucks and Volvo Trucks. Production consumes a great deal of energy and the plant uses both gas and electricity.

Blainville is situated in an environmentally sensitive area and environmental issues have occupied a top position on the agenda for many years. Over the past 15 years, the plant has succeeded in cutting energy consumption by 55 per cent. "We are working continuously to find new energy-saving actions and, in many of the investments that have been made, reducing energy consumption has been an important objective. We are also focusing on renewable sources of energy and, in this context, the Renewable Energy Project is playing a vital role," says Julie Michel, Environmental Manager, Blainville. ►

Zachery Wentz

COMMODITY BUYER AT GTP IN THE US



"It was my role to co-ordinate the activities in the US. As all the states have different requirements, we decided to focus on our main manufacturing sites which account for 90 per cent of total electricity consumption. The next step will be to find opportunities to also to include some of our smaller and remote entities in the programme.

"Another challenge was to get all the business areas to align with the requirements and move in the same direction. One of my main takeaways is the great collaboration, within both the purchasing team and the different business areas and other parts of the organisation.

"For me, personally, it was also great to make an impact on the sustainability vision the Volvo Group has. This project shows that we are actively working towards a more sustainable future."



Guillaume Perez



Mylene Perales

RENEWABLE ENERGY IS a global project initiated by Group Trucks Purchasing (GTP) in 2017, with the objective of introducing renewable energy at all Volvo Group facilities in France, Sweden, Belgium and the US from 1 January 2019.

Even though Sweden and parts of the US were already purchasing renewable electricity, the project demanded a totally new strategy for sourcing energy. Guillaume Perez, Senior Commodity Buyer at GTP, was responsible for the project at global level.

"When we started, we didn't know what the result would be. But we wanted to challenge the organisation to have standard requirements and a global mind-set when it comes to electricity."

Guillaume Perez also says he had strong support from his manager, Ilvana Delic, and Vice President, Marion Keller.

"Their engagement in sustainability was clearly a key success factor for this project."

The work was conducted cross-functionally and included employees from almost all business areas. While Guillaume Perez was managing the project at global level, his colleague Mylene Perales was responsible for the European countries.

"A large part of the work involved explaining to users what buying renewable energy means and what the benefits are," she says.

After nine months of hard teamwork, everyone was on board.



The welding process also represents an important amount of electricity consumption in Blainville. The transition to electricity from renewable sources will have a major impact on the plant's environmental footprint.

It is no coincidence that France, Belgium, Sweden and the US are taking part in the project. Together, these countries account for 80 per cent of the Volvo Group's total energy consumption and the transition to renewable electricity is having a major impact on carbon emissions. However, Guillaume Perez is hoping that the entire Group will eventually change to renewable energy sources.

"We started with the largest countries, but the small ones also have an important role to play. Poland has already joined and many more countries will be included," he says.

THE PROJECT HAS given Mylene Perales and Guillaume Perez some important new insights and they are looking forward to implementing the new business model in other areas.

"We should always investigate better methods of purchasing in terms of sustainability and environmental aspects, in line with the



requirements and aspirations in the Volvo Group Supplier Code of Conduct. We are really proud of having participated in this achievement. When you work for a large company, it can sometimes be difficult to see the results of what you do, but we know that this project will have a major impact and make a difference. It's like adding a brick to a big wall." ■

RENEWABLE ENERGY – THE PROJECT

- ▶ Part of the Volvo Group's environmental objectives to reduce and optimise energy consumption.
- ▶ In order to implement renewable electricity, the Volvo Group has agreed to a one–two per cent cost increase.
- ▶ In turn, this will reduce the Group's environmental footprint and contribute to sustainability.
- ▶ The renewable energy is certified by the European Guarantee of Origin standards and the Renewable Energy Certificate US standards.

3 QUESTIONS TO...

... **Björn Brovik**, Environmental Director Volvo Group, on the new environmental policy which was launched in January 2019.



Björn Brovik

What does the new environmental policy involve?

"It's an ambitious undertaking continuously to reduce environmental impact from a lifecycle perspective. It's closely linked to our mission and our values."

In which way?

"We know that reducing environmental impact and increasing sustainability are in synergy with our customers' success. It's also a question of trust that we are going to run our operations in a responsible manner, no matter where in the world we operate. We are also keen to drive change towards increased sustainability and circularity in society, thereby reducing waste, emissions and the use of resources."

What does this environmental policy mean to individual employees?

"Our employees are totally decisive. After all, all of us make the difference in the company. The policy specifies the principles and values that will provide guidance in both business decisions and everyday work. It is also designed to inspire new initiatives. Renewable Energy is an excellent example of this kind of project." ■

This is the new policy

Environmental progress is a key element in our mission to drive prosperity through transport solutions. The following principles provide direction for the work:

- Continually reduce lifecycle environmental impacts as an enabler for increased sustainability and customer success
- Demonstrate responsible care for the environment wherever we operate and build trust by adhering to our Code of Conduct
- Minimise resource use, emissions and waste and utilising means within our sphere of influence to create change towards a circular economy and to further improve our competitiveness



The first installation of the CampX concept is in Gothenburg focusing on electrification, connectivity and automation. It includes a range of resources to support innovation and collaboration. Most of the furnishings at CampX are either second-hand or made from creatively repurposed materials. The cushions (right) are made from worn work clothes from the Tuve plant.

Concept for new ways of working

Can innovation be super-charged through collaboration, partnerships and a smarter workplace? “Absolutely,” says Helene Niklasson who is leading the development and implementation of the Volvo Group’s new innovation and collaboration concept, CampX.

TEXT LINA TÖRNQUIST PHOTO ANNA-LENA LUNDKVIST

IN THE 1950S, the building that now houses CampX was home to one of the most modern truck production lines in Europe. Today, its airy, window-lined lobby not only doubles as a café but also houses a restaurant and events venue. In what was once a factory bay, hundreds of employees working in the areas of electrification, connectivity and automation are co-located together with external partners. It also includes a dedicated Innovation Center, collaboration areas, a battery lab, a concept vehicle lab and much more.

“The CampX concept aims to increase the opportunities for collaboration and to ramp up the pace of innovation, by offering a trusting and inspirational environment,” says Helene Niklasson, head of CampX.

With CampX, the Volvo Group secures and strengthens its position to drive transformation towards new disruptive business models and technologies. It aims to boost internal innovation capabilities as well as maximise the value of external collaboration, by inviting selected partners, such as customers, academia and authorities as well as other companies to develop transport solutions. “One key aspect of the concept is the power of co-location and collaboration,” says Helene Niklasson. “By being co-located we work much faster and can benefit and learn from each other.”

THANKS TO ACCESS to experts, tools, vehicles and other resources, CampX allows for fast and simple ways to test and accelerate ideas. It also



Helene Niklasson is head of CampX. The global concept was launched during the spring of 2019, and the first implementation is in Gothenburg. In what was once a truck factory in Lundby, the 8,000m² facility now includes office space, state-of-the-art concept and innovation labs for Volvo Group employees, as well as external partners. The concept will be launched globally.

allows strategic projects and partnerships to be managed in an efficient way.

From the start, the team behind CampX noticed a high level of enthusiasm and energy from the co-located employees and partners. Now the team is looking forward to further

develop and implement the concept in Gothenburg and at other locations.

"This is the first version of CampX and it will be a very exciting journey to follow the concept as it develops and expands globally," says Helene Niklasson. ■



3 QUESTIONS TO...

... Amra Insanic, Project Manager in charge of Facility Management at Volvo Group Real Estate. She has coordinated the interior design and facility management services at CampX.

What has been your aspiration?

"We want smart people to come and think: 'Wow, this is somewhere I want to work!' And to make innovation and collaboration easier."

How did you try to achieve this?

"Most of the furniture has wheels which provides total flexibility. It's easy to find different types of work environments away from your desk – on a sofa, in the café, at standing tables or in the mezzanine. Features, such as high ceilings and the interior colours, support creativity and a feeling of being welcomed into the building."

What are you most proud of?

"I'm really proud of the fact that most of the furniture is reused or made from repurposed materials. People often think that something that's second hand means that it's probably a bit broken, but that's not the case at all! My hope is that it will plant an idea among people to limit waste and reuse materials whenever possible." ■



Amra Insanic worked on the interior design of CampX. "It's been the most enjoyable project of my career," she says.

PHOTO: ANNA-LENA LUNDKVIST



Rachel Spieczny

DIRECTOR OF INNOVATION
DEVELOPMENT, INNOVATIVE
PURCHASING, GTP

"It's fantastic to work at CampX! Since moving here, myself and a cross-functional team have co-located in the very first 'CampX Project Room' to build the Volvo Group Additive Manufacturing strategy. This environment has enabled both speed and flexibility in our work."

Richard Hedman

SENIOR RESEARCH & TECHNOLOGY
DEVELOPMENT ENGINEER
AT GTO QUALITY & ENGINEERING

"I work here for two to three days a week and I sit next to new people every time. This has changed my way of working – there are not as many formal meetings and more spontaneous ones. CampX is a great platform for new partnerships, both within the Group and with external players."



Jonas Hagerskans

PRODUCT OWNER, VEHICLE AUTOMATION, GTT

"CampX is an excellent way of bringing together different skills and sharing knowledge and solutions. You meet colleagues in a different way; instead of writing an email, I just go over and chat. As I see it, building our prototype vehicles in the same building is a big advantage."

David Hellstedt

VP ELECTROMOBILITY
POWERTRAIN ENGINEERING, GTT

"Coming here to CampX gives me a lot of energy. It's an open landscape, in many ways. Those of us who work here are very visible and the environment creates the scope for collaboration. As we have the laboratory here, we are also really close to the products and so it's easy to meet and talk about them."

Karin Vester

ASSISTANT, AUTONOMOUS
SOLUTIONS, VOLVO TRUCKS

"As increasingly complex technologies develop, the demands that are set for collaboration and a cross-sectional working approach are being stepped up. CampX is a really good platform for this. It's up to us to take advantage of the opportunities that are created by being under the same roof."

What is it like to work at CampX?

CampX is designed to increase creativity and collaboration. Here, five Volvo Group employees share their thoughts on what it is like at the new innovation hub.





Karen Lee is Director of Technology Strategy and Innovation at the Volvo Group, together with Sebastian Franco, Andreas Höglind and Oscar Thuang.

A springboard for innovation

The CampX Innovation Center has been set up to guide innovative concepts from discovery to being market ready.

IN A LARGE ROOM just off the main CampX lobby is the Innovation Center. It is an initiative that has been set up to serve as a springboard for new ideas within the Volvo Group. The work focuses on applying new technologies and business models in early development phases.

“Even great ideas can be held back if people don’t know where to turn to for business support, internal and external collaboration opportunities, early-stage funding and visibility,” says Karen Lee, who leads the centre. “That’s where we come in.”

The centre is designed to have the tools and

resources to define, explore and accelerate new concepts. There is also space for colleagues and partners to sit and work closely at the centre during development.

A CONCEPT that receives support could come from inside or outside the Volvo Group. But the idea needs to be aligned with advancing the Group’s mission, vision and technology focus in areas such as automation, electromobility and connectivity.

“We have so much talent here at the Volvo Group, which we must leverage,” says Karen Lee. “By encouraging co-creation and development in partnership with each other, customers, start-ups, corporations and others – we can learn and achieve even more at a faster pace.” ■

LINA TÖRNQUIST

YEAR: **1924**

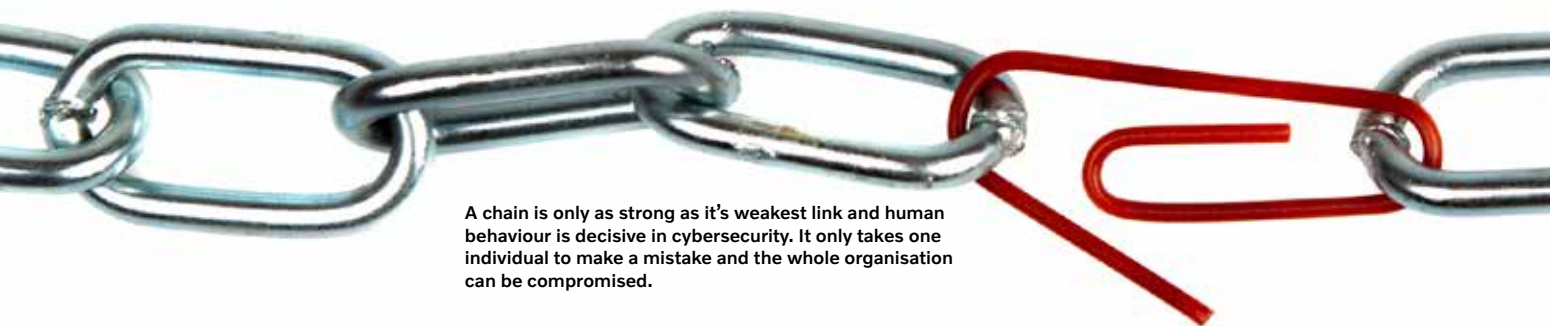
Electric pioneers

TODAY, ELECTRIC VEHICLES are seen as the future of the transportation industry, but the concept is far from new. In fact, as far back as 1924, Berliet – the predecessor of today's Renault Trucks – was producing an electric van that could deliver a payload of 300 kg, four horsepower and a top speed of 26 kmh. The electric engine was powered by a 225 amp-hour battery and could

travel around 80 kilometres before needing to be recharged. The model depicted here was originally used as a hearse. It is now owned by the Berliet Foundation and is currently on display at Renault Trucks' headquarters in Lyon, France. Since its electric engine produced no exhaust and low noise, the vehicle was perfect for slow-moving funeral processions. ■



PHOTO: DENIS CHAUSSENDE



A chain is only as strong as it's weakest link and human behaviour is decisive in cybersecurity. It only takes one individual to make a mistake and the whole organisation can be compromised.

Cybersecurity concerns us all

With the Volvo Group's enterprise operations, products and services becoming more digitalised, cyber crime is a growing concern for the entire company. Therefore, a new programme has been launched by the Volvo Group's security community.

THE VOLVO GROUP currently has some 100,000 employees globally and each and every one is a potential target for cyber criminals. This is why BE AWARE has been launched. The ongoing programme will continuously

inform all IT users in order to strengthen resistance to threats like social engineering and email phishing attempts.

"Previously, we have seen that most cyberattacks and threats focus

on our IT infrastructure and we have a security team that has been able to handle that," explains Thomas Klahr, Awareness Lead, Volvo Group IT. "But now we are seeing a shift with threats being directed towards user behaviour. There are more activities around the world designed to trick people into sharing information or click on dangerous links, and so people's behaviour has become the weakest point in cybersecurity."

THE POTENTIAL CONSEQUENCES

of a cybersecurity breach include sensitive information being stolen, shared with competitors or sold on the open market. With an employee's personal credentials, a criminal can gain unauthorised access to the Volvo Group's network and information. The digitalisation and connectivity in our business segment means that the Volvo Group is collecting more and more customer data via its products and services. If any such information is revealed unintentionally, it would be hugely damaging for the Volvo Group's image and trust in its brands.

"Information processed in our business applications is an important and valuable asset and protecting that asset is not exclusive to the IT organisation but to every individual in our entire business," explains Stefan Simonson, Information Security Director, Volvo Group. "Today, cyberattacks are becoming more commonplace, more dangerous, and more sophisticated. Since our employees are the first line of defence against cyberattacks, we need to strengthen their ability to identify attempts to steal our information, and



PHOTO: ESBJÖRN LARSEN

The Volvo Group's security team (L-R): Lars Gustafsson, Stefan Simonson, Anette Karlsson, Thomas Klahr, Yi Sun and Tobias Sternvik.



PHOTO: COLOURBOX

Things to keep in mind

AROUND 90 PER CENT of cyberattacks can be traced back to human error. Here are a few basic principles everyone working with the Volvo Group should keep in mind.

- Never give away your log-in credentials. No one from the Volvo Group or Group IT will ever ask you to share this over the phone or email.
- Any IT assistance should be initiated from you. If not, ask to call them back and ensure their contact details are taken from the Volvo Group's contact information in Outlook.
- Regularly visit the BE AWARE site on Violin (beaware.volvo.net). All the relevant information and training you need can be found in one place, which will be continuously updated and revised.

also make them aware of the risks when sharing sensitive information."

To help improve awareness and strengthen security, Volvo Group IT initiated the BE AWARE global programme, which aims to increase vigilance among all Volvo Group employees. In close collaboration with the Volvo Group University, Volvo Group Security, Group Trucks Technology and Volvo Group Connected Solutions, Volvo Group IT established an online resource for cybersecurity information and training that will be regularly updated.

"This will be a continuous learning process because when it comes to cybersecurity, we cannot rely on a single campaign or a one-off training session," says Yi Sun, Director, Product Cyber Security, GTT. "The threats are constantly changing and evolving, so our defences have to keep evolving too." ■

NIC TOWNSEND

A unique manufacturing experience

MAKE IT REAL is a new training for engineers developed by the Volvo Group University (VGU) in collaboration with GTT and GTO. The course was piloted at the Tuve Plant in Gothenburg in March. During one week, 11 engineers were given the chance to work in production.

The training aims to create opportunities to strengthen cross-functional collaboration and dialogue between production and design. "After experiencing challenges in the production environment, engineers will find it more natural to take account of the operators' working environment when new products are designed. It was fantastic to see that this pilot week alone resulted in a number of concrete improvement suggestions," says Katarina Beckman, Learning Program Manager at VGU.

Another week of training was run at the Tuve Plant in June and further courses are planned this year. Skövde is next in line.

"If it's successful, we hope to be able to take the concept to France and the USA. This is a unique opportunity for individuals and an excellent investment for the company," says Katarina Beckman. ■



Read more about MAKE it real in Navigator on Violin!



Fernando Esguerra was one of the engineers participating in the first training session. "MAKE it real made me understand the importance of smart and good assembly solutions," he says.

Hence Essick's job title is Testing Development and NVH (Noise Vibration & Harshness) Engineer within FVV-NA (Features, Verification, & Validation). "In my current role, I am working to communise testing methods to condense the total amount of different types of data acquisition system we use today."



PHOTO: STEPHANIE BARNARD



5

QUESTIONS ABOUT COMBINING WORK AND STUDIES

Hence Essick is a Testing Development Engineer based in Greensboro, North Carolina, USA. He was given the opportunity to forward his career by studying using the Volvo tuition reimbursement.

Can you tell us a bit about your career path?

"I grew up working in a body shop of a used car dealership owned by my father. After high school, I studied for a degree in heavy equipment and transport technology and then took a position with engine rebuild at a truck workshop in Greensboro. I eventually became a trainer for new technicians and a team leader. In this role, I had reached the highest level for a technician, which led me to look for new opportunities.

"In 2007, I joined the Volvo Group, setting up data acquisition systems and instrumentation for fuel-economy and dyno tests. I went on to lead two groups for six years before assuming my current role."

Two years ago, you went back to school to study in the evenings. Why did you do this?

"In my previous role as Vehicle & Driver Productivity Team Lead, I would sit down in year-end reviews with my team members and encourage the technicians to go back to school. I would push them to find training, seminars, or anything that would help them better themselves. So studying is a way for me to show them that 'If I can do it, they can do it.'"

"So, after several discussions with management and at home, I enrolled at a local university campus here in Greensboro, in 2017, to complete a bachelor's degree in electrical engineering. While attending, I did some research and found that, with some additional study, I could also do a degree in mechatronics."

What has the support of the Volvo Group meant to you?

"It has been crucial. Both the financial help from the Volvo tuition reimbursement, as well as the level of understanding and encouragement that has continued while I have been enrolled."

What do you hope will be the next step in your career?

"I hope to grow in my current role and take some time off to be a dad again. In the future, I think I would like to go into a management role or some form of leadership. I have experienced Volvo at multiple levels of employment, which could help in making good choices for processes and improving productivity."

Do you have any advice to others in the Volvo Group who want to learn new things and forward their careers?

"I know everyone is busy. I have a wife and two kids that are both active in sports. It's often difficult to find the time to be dad. Many people here at Volvo have not seen me struggle through the late nights, weekends of projects, homework and keeping up with everything at home. It's tough. But, if you want anything in life, you have to work for it. So, if you want to be ready for new opportunities, find your passion and set a plan in action. If the company is willing to invest in you as a person, then take them up on their offer." ■

ALASTAIR MACDUFF

Big push to learn and grow at VFS

Change requires movement. At VFS, a broad range of initiatives are in place to prepare both the organisation and its employees for the future.

A FEW YEARS ago, VFS set an ambitious goal: its employees should feel they are developing faster there than they could elsewhere.

"Our aspiration is that employees feel that they are getting daily growth opportunities and are close to the mission and purpose of the company," says Troy Heflin, Senior Vice President, HR at VFS.

Since then, VFS has launched a number of development initiatives, including so-called 'short-term assignments' and 'micro-assignments', in which employees gain experience by working in different markets or other roles, for a few weeks or months at a time.

Stacey Youngdale, VP Talent Management, has led the two-year 'Talent for Tomorrow' programme, which is tailored to both existing VFS employees and recent college graduates. Through the programme, candidates are given assignments that last three to six months and expose them to various areas of the company, alongside different colleagues, leadership styles and levels of the organisation. In addition, VFS has launched other ongoing initiatives connected to its iLab innovation lab and recently rolled out 'Captivate', an in-depth leadership development programme designed to support leaders in an environment of change.

In part because of these efforts, VFS is now ranked among the top employers

in the 'Great Place to Work' survey in several countries. And its HR team has also noticed an increase in both the number and quality of candidates.

"It's a dynamic time. We're facing disruptive change both in the transportation and in the financial services industry," says Troy Heflin. "These initiatives all help us to make sure we have highly engaged, skilled people well prepared for the future." ■

LINA TÖRNQUIST

PHOTO: DAN ROUTH



David McBane

GLOBAL FINANCIAL PLANNING AND ANALYSIS, VFS IN GREENSBORO, US

"Moving from the US to Australia for a short-term assignment was a big step. For me, it meant more than just professional development and an opportunity to learn a new skill – it also allowed me to expand my network and personal growth."



PHOTO: SAM CHIN

Richard Berkander

COMMERCIAL FINANCE ANALYST, VFS IN GREENSBORO, US

"I was looking for an opportunity that would accelerate my career development while allowing me to try out different fields. The Talent for Tomorrow programme offered the chance to work in various functions at different levels of the organisation on a global scale. It was so diverse and such a great development opportunity that I couldn't turn it down."



PHOTO: OLMO REVERTER

Katrina Yu

KATRINA YU, COMPLIANCE MANAGER, VFS CHINA

"I was very honoured to have been chosen for a short-term assignment at VFS Japan. It exposed me to different opinions and ideas, which pushed me to learn and adapt quickly. I have not only learnt best practices from other markets, I have also expanded my network and made new friends."

ILLUSTRATION: COLOURBOX

Get fit at work

Do you get tired from spending too many hours at your desk? Daniel Gunning helped create the 14-day exercise and nutrition plan 'Fit in 50 seconds' as a way to improve his well-being at work. Now it is catching on across the Volvo Group.



Daniel Gunning,
Head of Dealer and
Information Systems
Support UK and
Ireland for Renault
Trucks

"I'VE BEEN WITH the Volvo Group for 15 years –but it was first when I got into my previous role that I became much more desk bound. The job meant spending a lot of time training employees across the business to use IT tools: I was on the road, staying in hotels and eating fast food. I was putting on weight and my lifestyle was also affecting my mood. I felt like I was becoming a bit grumpy and less approachable. So, I got in contact with a friend of mine, who is a

personal trainer and has a master's degree in sports and exercise science and asked: 'What can I do to make me feel better?'.

"We sat down and put something together that we really thought would work in an office environment. We created what has become 'Fit in 50 Seconds'.

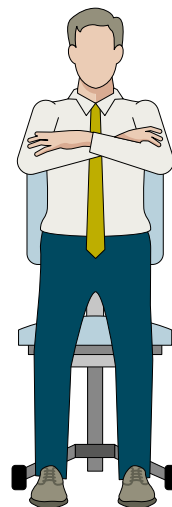
"The idea is to get out of a desk-based sedentary cycle by making small changes to your everyday lifestyle. Instead of parking in the space closest to the office – park a little further away and walk. Need to talk to a colleague about a project? Have a walking meeting. And, importantly, take a break every hour for a bit of exercise to increase your heart rate and get the blood flowing. The exercises are designed so that anyone can do them, regardless of gender, fitness level or age.

"The take-up has been great, both inside and outside Volvo. In the Warwick office where I work, it's been a great team-building exercise. Every hour, some teams stand up to do exercise, cheer each other on and have a bit of a laugh together, before going on with our day." ■

1



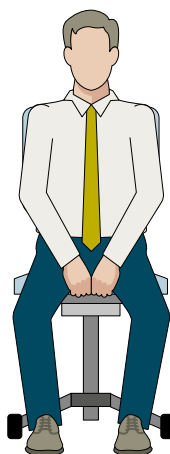
2



Example 1: Sit to stand

- Sit on the edge of your chair with your feet flat on the floor and hipwidth apart.
- Fold your arms across your chest and push through your thigh muscles into a standing position.
- Slowly return to the sitting position.
- During this movement, ensure that your knees stay in alignment with your feet.

1



2



Example 2: Upright row

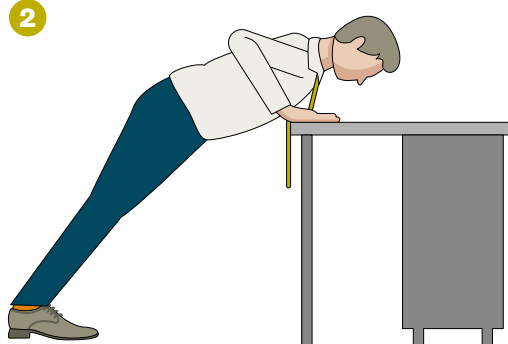
- Touch your hands together in front of your waist with palms facing towards you.
- Slowly raise your hands upwards until they are both just under your chin.
- Ensure that your elbows are higher than your hands throughout this movement.
- Hold this position for one second and slowly return to the starting position.

1



ILLUSTRATION: KEN NISS

2



Example 3: Push ups

- Position your hands on your desk and step back so you are now leaning your body weight on the desk.
- Slowly bend your elbows and take your chest towards the desk (as low as feels comfortable).
- Hold this position for one second, then push through your arms to return to the starting position.
- During this movement, ensure that you maintain good posture and do not bend at the waist.



Order your own copy!

Want to learn more about 'Fit in 50 seconds'? The entire 14-day programme is featured in a booklet produced by Daniel Gunning and his co-author, Chris Packham. To order, ask your HR department to email enquiries@fitin50.co.uk or visit www.fitin50.co.uk.

ANNELEEN VERHAEGHE

Involvement is key to driving change

LIKE WORKING WITH people and that is one of the reasons why I wanted to work with ergonomics. Each day, I try to spend time on the shop floor in Ghent. It allows me to speak to people and together we find ways to improve the work stations and their handling.

Ergonomics is essentially about the relationship between people and their daily work and an important part of my job is convincing people to be open to change. The key to this is involvement and participation.

When people are resistant to change, I try to identify where the resistance is coming from so that we can address it. If you want to improve a work station with multiple people, you get better ideas and better outcomes if you create a bottom-up approach. Forcing changes onto people does not work or does not last.

AT GHENT, WHEN we want to implement a change, we aim to apply the peer-to-peer approach. We start by trying new changes in pilot teams first. We ask for feedback from the other teams, we adapt, we try again and, when it is clear, we then expand the changes to other teams. This way, people can see the benefits for themselves. The process might be a little slower, but the results will be better because they will be embedded.

When I first came to the Ghent Plant, I felt like a firefighter. There were a lot of issues, but no structure for dealing with them. We came up with an ergonomics road map, so that we could work more proactively and have it embedded in our daily work.

Now, I no longer feel like I am the only one who cares about ergonomics, or the only person trying to drive change. We have a culture where the whole team is concerned with health and safety and we are all working together to make improvements. ■



ANNELEEN VERHAEGHE IS PART OF WORKGROUP ERGONOMICS AT THE GTO GHENT, THE WINNER OF THE 2019 VOLVO GROUP HEALTH AND SAFETY AWARD

Test your knowledge!

In this issue, you will find stories about everything from old electric vans to renewable energy and a new innovation hub. How much do you remember?

1 Approximately, how much of the Volvo Group's total energy consumption comes from Sweden, France, Belgium and the US?

- A. 65 per cent
- B. 80 per cent
- C. 50 per cent

2 In Singapore, tests with autonomous Volvo buses are under way. When does Singapore's government hope its residents will be able to make their first trips in self-driving buses?

- A. 2027
- B. 2025
- C. 2022



PHOTO: VOLVO BUSES

3 Last March, the innovation hub, CampX, was inaugurated in Gothenburg. In the 1950s, the same site had a different function. What was it?

- A. A shipyard
- B. A truck production line
- C. A restaurant

4 What was the top speed of the electric van that Berliet – a predecessor of today's Renault Trucks – was producing in 1924?

- A. 40 km/h
- B. 35 km/h
- C. 26 km/h

5 How long will it potentially take to download a HD movie on a 5G network?

- A. Four seconds
- B. One minute
- C. Two minutes



Read more about the wireless speaker at www.merchandise.volvogroup.com

A prize made to move you!

One lucky winner will win a portable Volvo Iron Mark wireless speaker with a design in brushed stainless steel combined with sand-coloured leather. Email your answers to groupmagazine@volvo.com no later than 1 October 2019. Write "Quiz" in the subject line and remember to include your name and address.

The winner of the quiz in *Volvo Group Magazine* #1 2019 was Anna Wallgren, Sweden. The right answers were 1B, 2A and 3B.