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Business Sweden's purpose is to help Swedish companies to grow global sales and international companies to invest and expand in Sweden. For Swedish companies, we provide strategic advice, sales execution and operational support. For international companies we ensure that they can rely on our knowledge, experience and extensive network to identify new business opportunities and achieve an accelerated return on investment. Business Sweden is present in 50 of the world's most promising markets and owned by the Swedish Government and the industry, a partnership that provides access to contacts and networks at all levels.

Paving the way for a digital future

nnovation has been a cornerstone for Swedish business culture for centuries. Global companies such as Ericsson, Volvo,
Astra Zeneca and Sandvik have emerged from this unique and broad culture. The Swedish brand stands for quality and reliability. High per capita purchasing power, healthy financials with technology and innovation at the forefront are other reasons why Sweden continues to be an attractive country to invest and operate in.

Sweden offers an international business environment that is modern and business friendly. Skilled professionals, smooth business procedures, and openness to international partnerships makes it an easy country to operate in. According to the World Bank, Sweden is among the world's top ten economies in terms of ease of doing business. Swedish industry will lead the way when climate change, globalisation and the digital transforma-

"Sweden offers an international business environment that is modern and business friendly."

tion demand rapid adaptation. Sweden is a pioneer for free and fair trade.

With the ongoing digital revolution, companies need to prepare for a transformation that is forcing

them to reimagine the way to operate. Successful Swedish companies have already been born, Spotify, Klarna and iZettle, to mention a few. However, the transformation encompasses much more than the ICT sector. New technology is transforming existing industries, such as manufacturing, materials, automotive and logistics.

The Swedish government has adopted a strategy for Sweden to become the world leader in harnessing the opportunities of digital transformation. We are set on continuing to be at the forefront of innovation. We welcome you to take part in this development.

Ann Linde Minister for EU Affairs and Trade

Mikael Damberg
Minister for Enterprise and Innovation





INFRASTRUCTURE



 $Illustration \ of \ future \ development \ in \ central \ T\"{a}by, \ north \ of \ Stockholm. \ (Illustration: Archus \ Arkitekter)$



INTERNATIONAL CONSTRUCTION FIRMS FIND ROAD TO SUCCESS IN SWEDEN

As Sweden's population and economy continue to grow, so does the need for transport infrastructure to meet rising demand.

nfrastructure investment in Sweden has hit a 20year high, creating exciting opportunities for global infrastructure companies in Scandinavia's largest market. For the period 2018–2029 the government has allocated around EUR 63 billion for investments into transport infrastructure, an increase of roughly EUR 10 billion more than the current plan.

The investment programme will bolster the already strong transport system to meet the needs of a growing population, as well as tackling the government's goal of reducing greenhouse gas emissions.

"Today we invest around 3,5 billion EUR a year maintaining Sweden's roads and railway system, but that figure will go up to 4,3 billion EUR," explains Anders Andersson, purchasing and logistics operations manager at the Swedish Transport Administration (Trafikverket), the public agency with overarching responsibility for the country's transport system, including roadways and rail systems.

The surge in funds comes in response to increased road traffic which has led to delays and disruptions for both businesses and workers.

Recognising this barrier to economic growth, the Swedish government has adopted an infrastructure bill that enables the Transport Administration to improve the standard of Sweden's existing roads and railway system.

"A good transport infrastructure is very important," says Andersson.

"Sweden's a big country, and companies need to efficiently transport goods. As the population grows and more people commute to jobs, it's important for them to have reliable transportation too."

Several major projects are now underway to improve transport infrastructure throughout Sweden. Andersson explains that top priority is more roads and an efficient railway that can transport more people in a shorter time, reducing congestion on the roads.

"We have big projects planned in Stockholm and Gothenburg," says Andersson.

AMONG OTHER THINGS, there are plans for high-speed rail lines such as Västlänken (The West Link), which includes a new railway tunnel running under Gothenburg; and Östlänken (The East Link), a high-speed railway between Järna and Linköping.

There's also the Stockholm bypass – Förbifart Stockholm – a massive project that will connect southern and northern Stockholm County and reduce inner-city road traffic by taking motorists around central Stockholm on a new roadway that includes several bridges and tunnels.

And that's just a glimpse of what Trafikverket has in store. A full list of planned and current procurements is kept regularly updated in Swedish and English on the Transport Administration's website.

THE SWEDISH CONSTRUCTION industry is dominated by several companies that are already trying to cope



INFRASTRUCTURE



A view inside the planned Västlänken tunnel, currently under construction beneath Gothenburg and due to open in 2026.

with an influx of infrastructure projects, including the building of around 600,000 more homes to address Sweden's housing shortage.

Thus the current construction boom represents an historic opportunity for foreign firms to help Sweden achieve its ambitious goals.

We're building a lot in Sweden at the moment," says Andersson. "Every town and city needs more roads, apartments, and transport infrastructure. But everyone wants to build at the same time, so there's a lack of construction companies right now."

So many major infrastructure investments means opportunities for international construction companies looking to take part in current and future projects, at all stages from planning and consultancy to building.

ON A NATIONAL level, the Transport Administration is tasked with handling budgets, procurements, and bidding, conducted through a comprehensive eight-point procurement process.

"We have our own planning process. Once we know how much money is involved, we can start with the procurement planning. We then inform the market about the procurement and when it is scheduled," explains Andersson.

Both Swedish and foreign construction companies are then invited to submit bids for the project.

Andersson says the key to success for foreign companies is partnering with Swedish firms who can help them to better understand all the rules and regulations.

"It's crucial for a foreign company to work with a Swedish company. For example, many rules related to the railways are not in English so it's not easy for a foreign company to just start working," he explains.

In turn, foreign firms can provide specialist knowledge and methods that increase innovation in Sweden's construction industry.

It's a safe and profitable undertaking for all involved, says Anders. All that's needed is the manpower to complete the projects.

"The projects are planned and the money is secure because, instead of private businesses which can be riskier, it's from the Swedish government."



Infrastructure minister: we welcome foreign companies

Sweden's Minister for Infrastructure, Tomas Eneroth, explains the needs and goals behind the country's historic investments in infrastructure and how foreign firms can contribute

Infrastructure investment in Sweden is at recordhigh levels, in large part to support the current government's priorities of jobs, schools, and climate action, including Sweden becoming one of the world's first fossil-free welfare nations

"The transport system is a basic condition for access to jobs and housing throughout the coun-

The competitiveness of business builds on reliable means of transport, within Sweden and through links with the rest of the world."

Among other things, major investments have been authorized for rail and roadway infrastructure operation and maintenance, including a 47 percent increase in spending on railway maintenance

Innovative solutions provide new possibili-

ties. New ideas are needed with regard to technology and infrastructure that can contribute to a more sustainable transport system,

"We are at the forefront when it comes to connected and automated vehicles - solutions that have the potential to "Infrastructure investments are key to a strong and sustainable Sweden."

Tomas Eneroth, Minister for Infrastructure

profoundly change the way we view mobility."

However, retooling and upgrading Sweden's transit infrastructure is hardly a small task, and will require a lot of "knowledge, competence and innovation", according to Eneroth.

"It's important to have innovative companies with cutting-edge know-how providing the best solutions," he says, adding that foreign firms with the right competence are "welcome to the Swedish

"I am glad to see that there is an interest from foreign companies to establish themselves in Sweden and to compete with their knowledge in these procurements," says Eneroth.



HUGE INVESTMENTS TRANSFORM STOCKHOLM AIRPORT INTO ARLANDA CITY

As Stockholm cements its spot as Europe's premier tech and startup hub, it's crucial for the capital to invest in new infrastructure to keep the Swedish capital globally connected.

tockholm is booming, thanks in part to a string of successful billion-dollar startups including Spotify, Klarna, and Skype. As the region's economy and population expands, so does its need for international flights and an airport built purposely for them.

In 2017, more than 26.6 million people passed through Sweden's major international airport, Stockholm Arlanda, continuing a trend from previous years which is expected to mean 40 million passengers will pass through Arlanda by 2040.

To accommodate for the rapid growth, state-owned airport operator Swedavia has several major investments underway or in the pipeline to increase terminal capacity and create several new areas to enhance passengers' overall experience of the airport.

The EUR 1,3 billion investment will primarily affect Terminal 5, the airport's largest and busiest terminal, and will be spent incrementally over the coming decades. The expansion will also create more jobs, with the number of employees at Arlanda set to more than triple from 16,000 to 50,000.

The historic expansion and upgrade also means there are lots of opportunities for international construction and airport services firms.

PLANS ARE ALREADY in motion to build a spacious and modern area with restaurants and shops, and a new pier designed to keep up with growing demand for intercontinental routes. The pier will be made to handle more passengers and larger aircrafts for long-haul flights, for example the more environmentally sensitive Airbus A₃80.

Arlanda in numbers

62.5%

Passenger growth since 2010

Passengers: 26.6 million Airlines: 81 Destinations: 181 Employees: 17,500 Passenger growth: 62.5%

since 2010

Record passengers in day: 100,000+ (May 24, 2017)

Among other developments, work will take place on Terminal 5's walkway to improve passenger flow, and Terminal 4 will see improvements to transform it into a more efficient hub for domestic travel.

Six districts known collectively as the "Airport City" will also take shape around the airport. The area, which will include new neighborhoods, offices, and a vibrant city centre, is forecast to play a critical role in the region's continued growth and development.

Throughout the renovation period, efforts will continue to reduce the airport's impact on the environment.

Stockholm Arlanda's ongoing work to reduce carbon dioxide emissions is already rated at the highest level of Europe's Airport Carbon Accreditation programme, and all new buildings will be constructed according to Swedavia's stringent environmental policy.

AMAZON WEB SERVICES TAKES SWEDEN TO A NEW HIGH



Darren Mowry,
Managing Director, Business
Development, Amazon Web
Services EMEA

#1

Lowest industrial electricity costs in Western & Northern Europe



Share of energy from renewable sources in gross final energy consumption within the EU

US-based Amazon Web Services, a world-leading supplier of cloud computing services, is launching its next EU-based data center region in Sweden during 2018.

n April 2017, Amazon Web Services, AWS, announced it would be opening a new data center region for its cloud computing services near the Swedish capital in 2018. Sweden's enterprise and innovation minister Mikael Damberg hailed the deal as "huge" for Sweden.

"They could do that wherever in the world, but chose to do it here," he said at the time.

AWS is building three new data center facilities located in Västerås, Eskilstuna and Katrineholm – each within an hour by train from Stockholm. These will be connected by dark fiber and become the AWS EU (Stockholm) Region.

The AWS investment is one of many examples of foreign-based companies looking to Sweden as the logical home for establishing or expanding data center operations.

"Sweden and the Nordics as a whole punches well above their weight when it comes to innovation, so it comes as no surprise that AWS ultimately chose Sweden," explains Darren Mowry, head of business development for AWS in Europe, Middle East, and Africa.

AMONG OTHER THINGS, Mowry cites Sweden's "thriving" startup community, close proximity to internet exchange points, high amount of renewable energy in the power grid, and easy access to a talented workforce among the factors that influenced the decision to make Sweden home to the next AWS Region in Europe.

Sweden also boasts a favourable climate and offers the lowest total cost of energy for data centers in Europe.

"We at AWS are excited to be a part of strengthening Sweden's IT infrastructure by offering Swedish and Nordic customers access to powerful and advanced cloud services – right in their own backyard," Mowry adds.

HE EXPECTS THE new AWS Region to strengthen Sweden's already thriving digital ecosystem.

"The AWS EU (Stockholm) Region will have very low latency to all Nordic capitals, allowing customers to access data and advanced cloud services more quickly. Startups and enterprises will also be able to store their data in Sweden, satisfying any data sovereignty requirements they might have," Mowry explains.

"Choosing to locate a Region in Sweden speaks to this rapidly growing customer base, the broad set of talent here, and the investment we are making to support cloud adoption. We are excited to work with even more customers in Sweden to help their businesses drive innovation while maintaining high levels of reliability and security," Mowry continues.

Mowry's positive assessment of Sweden's digital infrastructure is echoed by Enterprise Minister Damberg.

"The AWS investment in Sweden will strengthen our position in the global digital shift. For us, trade in a modern globalized economy is not only about goods, but also about services, sharing of knowledge, and the free flow of data," said Mr Damberg.







Geoff Hollingworth, Software engineer and cloud computing expert. Ericsson

Imagine if your smartphone stored several exabytes of data. Think billions of photos, videos, files, songs, and software. Thanks to the cloud, it kind of does.

illions of people use the cloud every day without really knowing what it is. "It's often the first thing we touch in the morning and the last thing we touch at night," says Geoff Hollingworth, a software engineer and cloud computing expert who works at Swedish telecom giant Éricsson.

The term was actually coined in the mid-1990s and reportedly stems from how computer networks were depicted in early diagrams.

And while there's been some progress since 2012, when 51 percent of people believed that stormy weather affects cloud computing, understanding of "the cloud" and its significance is far from universal.

"The functioning of society is increasingly dependent on being online, and the industrialization of the cloud is akin to having everything connected at all times," Hollingworth explains.

"This means that everyone on the planet can have access to whatever sort of computing resources they need instantaneously - and that's truly mind-boggling."

HOLLINGWORTH SUGGESTS THINKING of "the cloud" as a huge bag of Lego bricks. Any child can find and

assemble various bricks into any number of toys or structures. After one child finishes with one Lego creation, it can be disassembled and the bricks thrown back into the pile for the next child to use.

Because the bricks are constantly being built and disassembled, the single bag of Lego can spawn an endless supply of toys to countless children, constantly morphing to fit the tastes and trends of whoever's turn it is to play.

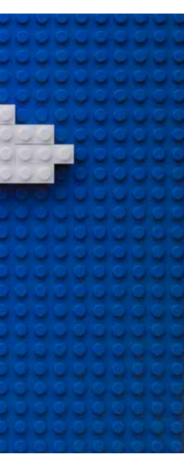
Similarly, cloud computing allows computing resources to be assembled and deployed according to the needs of countless users.

"Cloud computing is the most efficient form of generating computer infrastructure to date," he explains.

"It's incredible how quickly you can create, use, and reuse infrastructure in the cloud."

One of the many ways Ericsson uses cloud infrastructure is to test software, which requires "huge amounts of data" to give systems a real-life simulation on a global scale. Previously, running large scale global tests was a very infrastructure intensive activity.

With the cloud, we can easily simulate the amount of data and usage equivalent to what a city the size of New York would generate. We just spin up the simulation



in the cloud, run the systems, and then disassemble it all," he explains.

Just like Lego.

ERICSSON ALSO UTILIZES the cloud in an awardwinning environmental project in Malaysia where mangrove saplings were equipped with sensors that feed real-time information about soil and weather conditions to a cloud system that helps farmers better understand growing conditions.

"The Connected Mangrove Project demonstrates how the cloud helps us 'see' things remotely that can't really be seen on the ground," explains Hollingworth.

"It allows us to make and analyze observations and learn things that wouldn't have been possible before."

Truckmaker Scania is another well-known Swedish manufacturer deploying the cloud to make life easier for millions of vehicle owners across the globe.

"For us, cloud is more than a technology, it is a fundamental part of our strategy moving forward," says Michael Müller, Scania's director of infrastructure services.

Cloud-powered connectivity allows owners of Scania trucks to collect real-time running data and run diagnostics on their vehicles, thus reducing downtime and boosting customer profitability.

"Today the cloud focuses

humans with content, but in

the future it will focus more

us and with each other."

Geoff Hollingworth, Ericsson

on connecting machines with

mostly on connecting

The cloud has also opened up a completely new world of possibilities for budding entrepreneurs and startups.

One example is Swedish cleantech startup Watty, that's leveraging cloud computing to help homeowners make smart energy decisions. Users simply connect a special monitor to their fusebox, download the Watty app, and instantly get tips on how to reduce household energy consumption.

The cloud has made running a startup much easier and much cheaper," says Tyler Crowley, organizer of some of Stockholm's most high-profile tech events, including STHLM Tech Meetup and STHLM Tech Fest.

Crowley cites easy access to top-class cloud computing resources in Sweden is an important contributing factor to the success of Sweden's much-talked-about tech startup scene.

"It's the main reason that startups are booming now that the headache of running the system architecture and scalability issues are now just plug and play 'in the cloud'," he explains.

AND AS INTERNET connections get faster (5G networks will be rolled out in Sweden in 2018), more and more startups, corporate giants, and individuals will be moving their data processing and storage needs to remote locations in "the cloud" - namely data centers.

"With 5G, it will be harder to know where the cloud stops and your mobile starts. It will really be like having one system," says Hollingworth.

These fast connections, coupled with the "exponential growth" in the number of connected smart devices coming online with the Internet of Things (IoT), means that virtual bag of Lego needs to get a lot bigger - 163 zettabytes bigger every year, by some estimates.

"In a connected world with 5 billion humans and 50 billion devices online, there is a lot of data to be shared and stored about how everything is functioning," says Hollingworth.

This means an increased need for more large data centers (again, think bags of Lego), as data centers are ultimately the physical manifestation of "the cloud"; they are the remote locations where all that computing muscle and storage capacity resides.

And just how many more "bags of Lego" are needed for this industrial cloud future to become a reality?

According to one projection by cloud computing visionary Mark Thiele of the International Data Center Authority, we'll soon need more than 4,000 "massive" data centers each containing at least 100,000 servers.

"If the numbers follow a historical precedent at all we will need roughly 400 million servers to support our 2020 IoT and technology demands," Thiele writes.

THANKS TO ITS cold climate, abundance of natural resources, and low-cost renewable power supply, Sweden has already become a hotspot for data centers, attracting the likes of Facebook and Amazon Web Services (AWS). In addition, Google acquired property in Avesta as a potential data center location.

"In Sweden we found super connectivity thanks

to an extensive and reliable fiber network and a thriving startup community churning out innovative technologies and companies, as well as a commitment to environmental sustainability that aligned perfectly with that of AWS," explains Darren Mowry, AWS's head of business development in Europe.

And considering the enormous energy requirements

that come with keeping thousands of power-hungry data centers running, Sweden's "sustainable computing" approach could help the industry meet growing data center energy requirements.

"If Sweden could be the first country to decouple economic growth from carbon emissions, then surely the same could be achieved in the data center industry," writes Tomas Sokolnicki of Data Centers by Sweden.

Looking ahead, Hollingworth believes we're on the cusp of a major shift in how cloud computing is used that will further rewrite the requirements for speed and data storage.

'Today the cloud focuses mostly on connecting humans with content, but in the future it will focus more on connecting machines with us and with each other," he continues.

"Rather than people accessing data, you have machines looking and analyzing it. It's a real game changer."

And as Sokolnicki sees it, this shift in how cloud computing technology is applied brings potential for disruption to a whole new level.

"Any small startup with a good idea and the modest financial resources needed to connect to the cloud can take on almost any established company, anywhere in the world."

TOUCH OF NCORNS



Professor Robin Teigland, Department of Marketing and Strategy, Stockholm School of Economics

With the second largest concentration of billion-dollar companies per capita, Sweden has been dubbed "the land of unicorns". But what is it exactly that gives this small country nestled away in the Nordics such a magic touch.

hen you hear the word "startups" you might immediately think of Silicon Valley. Sure, the region in California may still be the world's most prolific tech hub, but Sweden is a close second.

And what's more, Sweden isn't just producing startups, it's breeding unicorns - startup companies that are now valued at USD I billion or more. Quite impressive when you consider 90 percent of all startups are doomed to fail. Even more so for a country with a population of just ten million people.

Professor Robin Teigland from Stockholm School of Economics specialises in how startup companies become unicorns. Her research has led her to believe that the key to success is treating a startup more like a film production than a company.

"Think of a startup like a temporary organisation continuously moving from project to project in which you need a different constellation of resources for each phase," she explains.

"Then you can use your network to access the resources you need, where the focus is on access rather than ownership. This way you can be more flexible and change direction more easily."

TO CARRY OUT her study, Teigland spoke to the CEOs of various unicorn companies, one of whom divulged their formula for success, explaining it involves maintaining high ethical standards, designing a business model that focuses on profitability and not just growth, and seeking out suitable talent with the same values as you – wherever it may be in the world.

Five startup success factors

- FLEXIBILITY: companies need to adapt to changing market conditions. A more flexible structure makes it easier to access the right resources at the right time and to pivot quickly when needed
- HIGH STANDARDS: quality breeds success, both when it comes to what a company offers, but also when building a team. Find the best people and give them tools to grow
- FOCUS ON PROFIT, NOT JUST GROWTH:
 lots of growth can feel great, but if profits
 don't follow, even the fastest growing
 startups will have a hard time reaching
 unicorn status
- INFORMAL NETWORKS: Swedish companies' flat hierarchies and strong informal networks facilitate the flow of ideas and resources across new constellations, breeding further innovation
- PUTTING THE USER FIRST: the most advanced technologies derive their power not from their complexity, but from how many people use them. Never forget it's al about satisfying users' needs.

Interestingly, her study also suggests that bringing in an external CEO can contribute to a startup's success. She examined the board and management of Swedish unicorns and found this was a recurring phenomenon.

However, Teigland does admit this approach can backfire, as it did with one company she investigated.

"It doesn't always work. It depends on the skills of the founder of a company as well as those of the CEO who's been brought in."

Other factors that can have negative consequences for startups include putting too much focus on technology instead of what the user needs, and hiring within one's own network instead of seeking talent elsewhere.

That being said, Teigland says that the informal networks in Sweden are a strong contributing factor in the country's startup success, and that Swedish culture also plays an invaluable role.

"Informal networks are one of the reasons for Sweden's startup success," she says.

"Resources flow through these networks and Sweden's low power distance and flatter organisations, as well as its 'lunching out' culture, enable the building of networks and the sharing of resources."

SIX SWEDISH UNICORNS YOU SHOULD KNOW

SPOTIFY



This digital music streaming pioneer came online in 2008 and now boasts more than 70 million subscribers that pay to access a digital catalogue of more than 30 million songs. The company has a valuation of USD 19 billion, with an IPO expected in 2018.



SKYPE

Co-founded by Swedish entrepreneur Niklas Zennström in 2003, this innovative internet voice and video chat service was purchased by Microsoft in 2011 for USD 8,5 billion



KING

Perhaps best known for creating the hit game Candy Crush, King has created more than 200 games played by roughly 300 million users every month. The company was acquired by Activision Blizzard in February 2016 as part of a deal worth USD 5.9 billion.

MOJANG



Founded in 2009 by Markus "Notch" Persson, Mojang is the game developer behind Minecraft, one of the best-selling video games of all time with 144 million copies sold. In September 2014, Microsoft bought Mojang for USD 2,5 billion.

KLARNA



This online payment service was developed by three students back in 2005 and now has 60 million users generating 650,000 financial transactions a day. The company has an estimated value of more than EUR 2 billion.

EVOLUTION GAMING



Founded in 2006, the company is a major player in the booming online gaming sector. Its share price more than doubled in 2017, pushing Evolution Gaming's value over USD 2,7 billion.

HOW AN ESTABLISHED FIRM IS HARNESSING **SWEDISH STARTUP** INNOVATION



Klaudia Eriksson, Pfizer's Digital Innovation Lead

Healthcare giant Pfizer demonstrates that market leaders should view the digital health innovation taking place in Sweden as an opportunity, rather than a threat.

igitalisation is radically changing the healthcare industry and shaking up long-established business models. Pharmaceutical company Pfizer, established in 1849, sees digitalisation as an opportunity to grow with the times and collaborate with emerging healthcare startups in Sweden and elsewhere.

"We want to cooperate with companies that are disrupting and challenging the present status quo to help transform and change our patients' lives," explains Pfizer's Digital Innovation Lead Klaudia Eriksson.

"We are looking for digital solutions that can improve access to care and treatment results for patients all over the world."

Thus it should come as no surprise that Stockholm is home to one of a select number of Pfizer Healthcare Hubs, an initiative the company launched in 2017 to support established startups and accelerate digital innovation in healthcare.

"The Stockholm Healthcare Hub is part of a global network of digital innovation hubs with dedicated resources to identify, interact, and support startups," says Eriksson.

"We see Sweden as a good test market due to the high level of digitalisation in general, but within the healthcare sector particularly."

DIGITAL HEALTH STARTUPS in Sweden are developing technologies that have the potential to transform the future of medicine and Pfizer wants to be a part of that "digital revolution".

"We can help startups test a solution, develop a product, and give them access to Pfizer's global network, resources, and internal expertise," she explains.

Sweden's success as a digital health innovator stems from several factors, according to Eriksson, including strong engineering education programmes that create



"strong ecosystem of highly qualified and creative individuals".

Sweden can also draw on a strong heritage of successful pharmaceutical companies such as Pharmacia, Astra Zeneca, Orexo, and Meda, which together have had a "big impact" on the development of digital health in Sweden.

SHE ADDS THAT digitally-savvy Swedes are quick to pick up new technology, so it can be speedily improved and scaled up to launch in other markets.

"People are not afraid to try new technology," says Eriksson.

"The high digital maturity and openness for innovation is one of the aspects that makes Sweden an interesting and dynamic market for digital health innovations.



Leading the eHealth revolution

Digitalisation is transforming health and social care, and tech-savvy Sweden is spearheading the global phenomenon.

The Swedish government has claimed that by 2025 Sweden will be the best in the world at using the opportunities created by digitalisation for healthcare services

And those opportunities are broad and many.

eHealth and its subset mHealth (mobile health) are shaping the healthcare landscape, and offering innovative solutions for future social services and medical care

Darja Isaksson, who is a member of the Swedish government's Innovation Council, explains that eHealth is already impacting the healthcare system in many ways.

"Digitalisation makes it possible to achieve better outcomes because you can personalise anything from medicine to treatment," she says.

"You can also use data to spot patterns so there can be more proactive intervention, for example finding the people who are most likely to become the most expensive to care for."

She mentions Swedish innovation company Aifloo, which has developed an eHealth system to improve the lives of elderly people in need of care based on medical artificial intelligence.

medical artificial intelligence.
Crucially she adds, digitalisation puts
control of treatment and medication into

"The innovations enable people to take more responsibility themselves. It gives us more power over our own health, makes us less dependent on others, and provides the information we need to actively stay healthy."

"To diagnose certain symptoms doesn't require a physical exam, rather a structured interview."

Darja Isaksson, member of the Swedish government's Innovation Council

She explains that it also has the potential to reduce healthcare costs by billions, and relieve strain on healthcare systems that are already at breaking point.

"The whole industry is under a lot of pressure because people are living longer and previously deadly diseases are now chronic. eHealth is what we need to be able to continue providing high-quality and better health outcomes."

The increasing popularity of medical apps, like Sweden's Doktor24 which offers online doctor's consultations, are also reducing unnecessary contact time.

"To diagnose certain symptoms doesn't require a physical exam, rather a structured interview. You can increase the quality of the interview because machines don't forget to ask questions, as well as reducing diagnosis time from thirty minutes to two."

It helps, Isaksson adds, that Swedes are the perfect market to test new digital solutions.

"Swedes have a very positive view of using data for health and innovation. We are a highly digitalised population that is prone to jump on trends collectively, all ten million of us!"

In terms of innovation, Isaksson notes that SciLifeLab, Sweden's national center for molecular biosciences, is at the forefront of advancing technology that has made human whole genome sequencing possible in large scale.

"I know other countries are wrapping up efforts to do similar things and they are spending a lot of money. In Sweden, we've already done it and we didn't spend a lot. So there's a lot of valuable insight and knowledge here."

COMBINING OLD **AND NEW: HOW** TRADITIONAL FIRMS COOPERATE WITH STARTUPS



Peter Löfgren, Managing Director of SynerLeap

Swedes have long been aware that the key to success is strength in numbers. Effective collaboration is the country's driving force for innovation and growth.

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lab, for example."

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ut collaboration doesn't happen without conscious decision. And the Swedes know it. They understand that teamwork is a crucial part of creating something new and potentially disruptive.

And the strength of that collaborative ethos is on full display at SynerLeap, in an unique innovation growth hub

located in Västerås in central Sweden backed by industrial giant ABB.

Launched in 2016, SynerLeap is right in the heart of ABB's corporate research centre with the aim of creating an ecosystem that speeds up innovation cycles, helping startups get to market faster and expand in a global marketplace.

Peter Löfgren, Managing Director of SynerLeap "The intention is to help startups take the leap within the industrial field," explains Peter Löfgren, Managing Director of SynerLeap.

"We are working on shortening the innovation cycle. If we're too slow and it happens somewhere else, then we all lose out. But if we cooperate to make it happen, we all become winners."

CREATING A DEDICATED space for this synergy to take place strengthens competitiveness, and produces a more robust offering in SynerLeap's three areas of focus: industrial automation, robotics, and energy.

Throughout the collaboration, startups get access to ABB's world-class facilities, including state-of-the-art technology and laboratories.

"It's about sharing," says Löfgren. "Companies can use the infrastructure that ABB has here, like the robotics lab, for example."

The startups can also interact daily with ABB's team of leading experts and scientists. Löfgren adds that regular interaction between the groups builds trust between the startups and ABB.

"Trust is really important. Without it, startups are afraid that big companies will eat them for breakfast. And the big company is afraid the startup may fail and then take confidential information with them to their next venture."

Furthermore, this increased interaction creates the right climate to quicken the innovation cycle.

"If you have formal meetings everyone takes too long

to decide on common goals. Here we have a coffee and interact a lot. Our interaction level is probably ten times higher than before SynerLeap because we share the same environment."

It's a unique benefit that is immensely attractive to any company that wants to reach a global market and scale up its business.

AMONG THE CURRENT member companies are Einride, which is developing the world's first completely emissionfree, road-based transportation system; Mobilaris, a leading provider of software solutions for location-based services; and Penny, a research and innovation company creating Augmented Reality glasses.

"We're helping all the 19 companies to accelerate much more quickly and giving them the chance to take that leap.

"If you want to expand in an industrial market it's very costly to do it yourself. ABB gives them the global presence and ianfrastructure to do it," says Löfgren.

But it isn't just the startups that reap the benefits of the collaboration. In turn, ABB can learn from fresh, dynamic talent and together they can create new solutions for industry and energy.

It's a win-win for all, says Löfgren.

"We get the speed and agility from the startups and they get the global presence and muscle of working with ABB. Combining these two worlds makes so much more possible."

Swedish incubators & science parks

member organizations

5,000 companies 70,000 employees 4.000 business ideas evaluated





Ignite Sweden: where innovations catch fire

ABB is also one of more than 20 major companies involved in Ignite Sweden, a project which aims to build commercial partnerships between large companies and small innovative startups. Since its launch in early 2017, Ignite Sweden has matched 37 companies with 140 tech startups across the country.

Startups have a chance to explore how their offerings may help solve challenges facing established companies. These companies in turn can connect with Sweden's most promising and innovative startups and gain access to new insights and opportunities.

THINGS, business accelerator STING, and business incubator LEAD, in collaboration with state research promotion agency Vin-

(SISP), the tional association for business incubators and science parks.

A not-forprofit asso-ciation, SISP has 65 members which organise 43 business incubators and science parks. Around 5,000 are involved with the aim of creating an

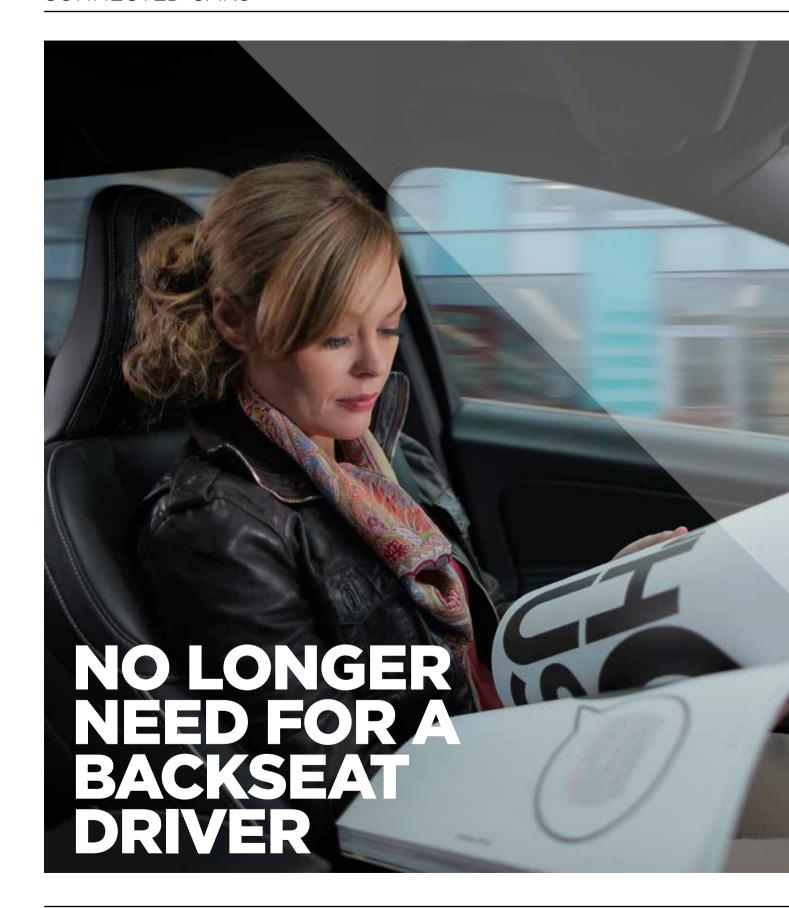
"We see this as a step in our associations work to make it easier for startups and large companies to find and do business with each other."

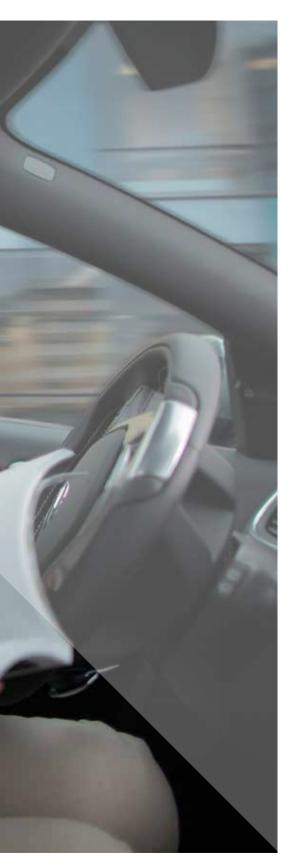
Magnus Lundin, former SISP

accelerates economic and societal growth. and science parks can offer large companies exciting solutions, services, and products that they have a hard time developing themselves because they don't have the creative environment that exists in an incubator or science park," says former SISP CEO Magnus Lundin says of Ignite Sweden.

"We see this as a step in our associations work to make it easier for startups and large companies to find and do business with each

CONNECTED CARS





Volvo Cars gave the world the three-point seat belt so it's no surprise that the Swedish automobile giant is leading the way with safe, hi-tech connected cars.

riverless vehicles and zero road deaths might sound like something from a science-fiction film but both are approaching reality in Sweden. Volvo Cars began testing self-driving cars as long ago as 2013, and since then the project has accelerated on several fronts.

One example is Volvo Cars' involvement in the innovative 'Drive Me' project, designed to involve real people in testing self-driving technology.

And Volvo was flooded with interested applicants after they announced the project, which involves dozens of Swedes test driving a unique XC90 on designated routes on some of the busiest streets in Gothenburg.

As the vast majority of road traffic accidents are caused by human error, the aim of the 'Drive Me' project is to learn how drivers' react and interact when surrendering the controls of the vehicle. All of the data from the testing, e.g. how a car navigates traffic, will be analysed by Volvo's team of engineers and used to create an ultra-safe self-driving

AND WHILE ONE human can learn from a driving mistake, Volvo's connected-cars technology allows the same lesson can be transferred to a million other self-driving cars and save lives in the process.

Sweden has long campaigned to minimise the number of road deaths. Indeed, Vision Zero was launched by the Swedish government in 1997, when more than 500 people were killed on Sweden's roads, and since then the number of traffic-related fatalities has decreased by almost half.

And on Sweden's west coast there is a dedicated test facility, AstaZero, tasked with trying to reduce that figure further, with the aim of having zero road fatalities in Sweden.

Billed as the 'world's first full-scale test environment for future road safety', AstaZero has attracted backing from the likes of Volvo and Scania due to its pioneering work. The unique test facility can simulate any potential scenario on the road and make it a reality.

Naturally, autonomous vehicles are on the agenda at AstaZero along with many other hi-tech programmes such as communication systems to enable cars to communicate with other vehicles. There is also the ongoing development of sensors that, in time, will be

able to detect if a driver is becoming sleepy or has alcohol in their system.

Together with backing from Swedish vehicle makers, the research at AstaZero also has the brainpower support from Gothenburg's internationally renowned Chalmers University of Technology.

China's Geely Holding Group, which owns Volvo Cars, also chose Gothenburg as one of its research and design hubs for the company's latest automotive brand, Lynk & Co. Indeed, southwestern Sweden is quickly gaining a reputation as an automotive Silicon Valley with German engineering giant Bosch choosing Gothenburg for development of automotive systems and components, and Lund for a mobility systems innovation incubator.

A holistic approach to road safety has been mapped out as part of the Drive Sweden initiative, a government-backed strategic innovation programme that brings together leading companies in the mobility, transport, and tech sectors. The programme allows various stakeholders to work together to explore completely new approaches to mobility, with self-driving cars just one component of the overall strategy.

"A car sits idle for 95 percent of the time; we see this as being like the Spotify of the transportation industry. We need to start sharing resources," explains Drive Sweden Program Director, Jan Hellåker.

INTERNATIONAL INTEREST IN the project has been huge with ministers from Singapore, Japan and China visiting Sweden to monitor the latest developments. Hellåker says that Sweden is continuing its trendsetting approach with the project.

We traditionally have a more holistic way of doing things compared to other nations. There isn't any other country that has this type of government sponsored involvement on a project of this nature," he explains.

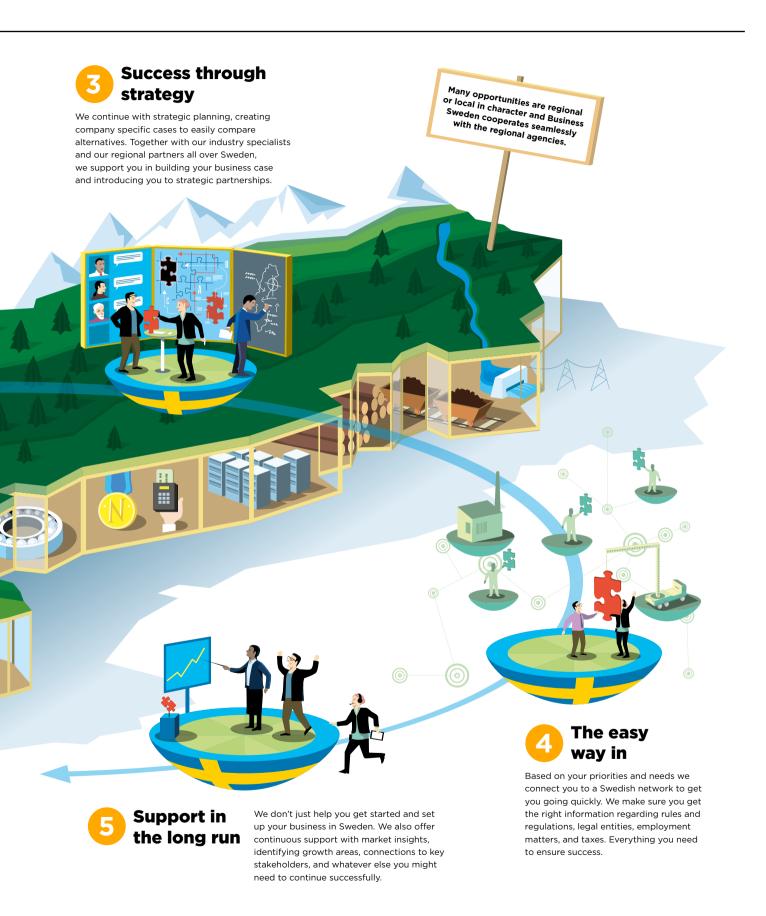
'Sweden has a very strong automotive industry, which has been very responsive and quick to get onboard. Everybody in the industry realises that something major is about to happen and it is happening fast."

And with Volvo recently inking a deal with car sharing service Uber for thousands of autonomous vehicles, it seems as though driverless cars and a new approach to mobility are here to stay. Just like the three-point seat belt.

THE SMOOTH WAY **TO BUSINESS SUCCESS**

Competitiveness and improved results are on every company's agenda. Sweden has the competence, the resources, and the markets to help you succeed. This is how Business Sweden can help you, every step of the way.







SWEDEN ON TRACK TO BE THE NORDIC'S **KEY IT HUB**

Sweden is in the midst of a major period of digitalisation. For progress to continue unabated, 30,000 IT professionals are required, a figure expected to double by 2020.

T investments in the Nordics are estimated to reach 66 billion EUR in 2017, twice as much as other European countries like Germany and the UK.

The investments reflect the country's combined efforts to digitalise all industries, with a particular focus on retail, manufacturing, and finance.

Digitalisation of government services has also been prioritised, and is now the second largest sector in terms of IT spend.

Even Sweden's most established global companies are taking on extra manpower to successfully adopt new technologies.

IN 2016, INDIAN multinational IT services company HCL closed a USD I billion-plus deal with Swedish manufacturing company Volvo Group. The deal included full acquisition of Volvo Group's external IT services along with its end-to-end internal outsourcing.

"Sweden is home to some of the biggest multinational brands across industries," says Jan Fredriksson, a spokesperson for HCL in the Nordics.

"These companies are growing while also embracing the technological advancements happening today. We believe that this Global Shared Services Delivery Centre will be a key hub and growth engine for HCL's European business."

Fredriksson adds that due to rapid adoption of technology by Swedish giants like Volvo, IT companies across the globe have set their sights on Sweden.

IBM is another example of how global IT companies can leverage Sweden's educated workforce and climate of innovation to benefit operations across the Nordics.

The US computing pioneer chose Malmö in southern Sweden to locate its Nordic Client Innovation Center.

The facility, which employs around 300 people, offers services to meet increasing demand for flexible software capabilities related to the cloud, big data analytics, and mobile technologies.

"We see that IT is an industry for the future where the need for competence and experience will continue to grow," says Johan Rittner, Country Manager for IBM Svenska AB.

With its vibrant and innovative startup scene, the country is the ideal location to set up operations – international companies can also take advantage of the fact there are no restrictions on foreign ownership or the need for local partners.

MORE RECENTLY, GLOBAL testing service provider TUV Rheinland of Germany acquired a wireless lab near Lund previously owned and operated by India's Tech Mahindra.

"The laboratory in Lund is a great platform for TUV Rheinland to tap into the entire Scandinavian market," explains Anders Nordlöf, head of TUV Rheinland in Sweden.

And there's no end of opportunities for foreign firms capable of helping Sweden on its quest for digitalisation – and the government is also fully behind Sweden's digital transformation, having released a comprehensive strategy in 2017.

"This strategy is a whole-of-government commitment to leading the change," says Minister for Digital Development Peter Eriksson.

"We want to be at the forefront of development. This will enable us to influence how technology changes our society."

Seven key capabilities for digital transformation

- DIGITAL LEADERSHIP: To what degree do you have executive sponsorship and broad, capable digital leadership of your digital transformation agenda?
- FUNCTIONAL CLARITY: To what degree do you have clarity of the functional responsibility for articulating a companywide direction and for executing operational digital initiatives to secure agility and speed?
- WAY OF WORKING: To what degree is a startup mindset and methodologies (processes, tools, etc.) adopted into the relevant parts of the business (and corporate working practices)?
- COMPETENCIES: To what degree are you able to identify, attract, assimilate, and retain the necessary competencies to succeed with your digital transformation agenda?
- GOVERNANCE AND PERFORMANCE: To what degree does your governance model support the desired future mindset, new way of working, and agile decision-making process necessary to succeed with your digital transformation agenda?
- TECHNOLOGY DEVELOPMENT: To what degree do you have an agile technology development setup that ensures fast tracking of build and scale development activities without compromising your operational IT?
- EXTERNAL COLLABORATION: To what degree do you leverage complementary resources in open and collaborative ecosystems to enhance your transformative capacity?

And a recent survey conducted by Vanson Bourne for HCL showed that digital transformation is a priority for a majority of Nordic companies, with 80 percent have already formalised a digital transformation strategy.

However, only 22 percent can be considered digitally mature, suggesting there is ample opportunity for providers of digitialisation services to help companies and public bodies complete their digital transformations.

"The digitalisation process needs to be optimised according to the specific industries and businesses," explains HCL's Fredriksson.

"At times this is making the workplace secure, safer, and engaging, and at times enhancing the customer experience."

For HCL, the acquisition of Volvo's external IT business has created significant opportunities for the company in Sweden and the Nordic region as a whole.

"New key competence and significantly increased local presence has made HCL one of the most relevant companies in the region," he adds.

NATURAL RESOURCES **MEET HUMAN** INGENUITY

Cutting-edge research into raw materials found in Sweden and elsewhere is giving rise to an array of exciting new materials.



Carbon fiber with a twist

Chances are, you've heard of carbon fiber, the hi-tech material long used to construct Formula 1 cars. At Innventia, which is part Sweden's RISE research institute, there is a different kind of race going on - the quest to make carbon fibers out of renewable materials rather than oil.

In a cooperation project with leading Swedish research institute SICOMP, researchers have found that carbon fibers can be produced from a wood-based by-product known as lignin.

Using a unique technology known as LignoBoost, the lignin is extracted from a kraft pulp mill and yields a product so pure that it can be used for manufacturing

And there's lots of potential considering the size of Sweden's forests. Researchers estimate the theoretical capacity for lignin extraction in Sweden to be about 2.8 million tonnes per year – enough to produce carbon fibres to make 25 million cars 10 percent lighter.

Although still in the laboratory stage, the potential for an alternative way to produce carbon fiber using readily available raw materials could pave the way for far more products to come on the market using the superlight and strong material. One example could be larger and more efficient wind turbine rotor blades made from carbon instead of glass fibers.

Stronger than steel, thinner than paper

Thinner than paper and stronger than steel, graphene is another material generating plenty of attention and where Sweden is at the forefront.

Among other things, Sweden's prestigious Chalmers University of Technology has been awarded the coordination of the EU's Graphene Flagship, which has more than 150 academic and research groups working in collaboration since 2013. With a budget of EUR 1 billion, it is Europe's biggest ever research project.

Graphene is made from a single layer of carbon atoms and is a million times thinner than paper. The revolutionary substance is stronger than steel and conducts electricity and heat more effectively than silicon. If the research comes to fruition then the entire electronics industry will be revolutionized with longer life computers just one potential beneficiary.

"Our mission is to take graphene and related materials from the academic laboratories to the factory floor. After four years we see that the focus of the Graphene Flagship is moving from materials development towards the realisation of full components, devices and systems integration,"

Flagship. "We are exactly on schedule and I am very confident that we will reach

says Professor Jari

Kinaret, Director

of the Graphene



Batteries for the future

Sweden is rich in minerals and the leading mining nation in Europe. Demand for batteries in electrical vehicles is surging, which leads to growing interests from foreign companies to explore Swedish lithium deposits.

Further south from the Northvolt project in Skellefteå is the municipality of Bergby where Canada's Leading Edge Materials Corp has an ongoing lithium project. The firm reported encouraging results from the initial drilling program in the region and now the project has expanded with permission granted for 48 new drill sites.

"Bergby has rapidly shaped up as a highly-ranked lithium project in the Nordic region," says Blair Way, President and CEO of Leading Edge Materials Corp.

As the Northvolt project demonstrates, the number of battery-driven electric car engines is expected to increase, and with it, the demand for lithium has never been greater.

"This project sits well within our strategy of acquiring low holding cost assets while we advance our graphite business model to supply the lithium Ion battery market. The lithium grades of the boulders and the scale of the project areas discovered to date demonstrate the prospectivity of the project," adds Blair Way.

The Canadian firm also operates the Woxna graphite mining program in nearby Gävleborg and is expanding its' operations across Sweden due to the country's plentiful resources of natural minerals and reputation for innovation.

Australian Talga Resources have a high quality graphite deposit outside of Kiruna. The graphite is of such high quality that it can be converted into graphene. This has been successfully in laboratory scale and the company now plan to build a demo plant in Sweden.



H&M and IKEA want people to start wearing trees

Swedish behemoths H&M and IKEA have secretly teamed up to become partners in Treetotextile, a green tech company manufacturing environmentally-friendly textile fibres.

The small company, based in Bjärred, Skåne, was founded in 2014 by chemist Lars Stigsson. It works to develop a process for making textiles out of cellulose fibres, which are obtained from the bark, wood, or the leaves of plants

"Demand for environmentally-friendly textile fibres made from renewable raw materials continues to increase," Treetotextile wrote in its most recent annual report.

industrialize new cellulose-based textile technologies in order to promote increased used of more sustainable

Recent advantechnologies have raised the possibilities of trees becoming an alternative to traditional cotton and oil-based products while at the same time promoting sustainable forest management.

it was announced that H&M and IKEA would be"Demand for environmentally-friendly textile fibres made from renewable raw materials continues to increase"

Lars Stigsson, CEO of Treetotextile

come partners in Stigsson's business. Together they now own two thirds of Treetotextile, and along with the founder have invested into the venture

It marks the first time H&M and IKEA have officially worked together, although both have previously invested in green tech research. Eventually they hope to commercialise the

The company has so far generated no revenue; however, H&M points out that it is still early days and they see it more as a long-term investment.

CROWDFUNDING **AND 3D MODELING:** HOW DIGITIZATIO IS CHANGING T CONSTRUCTIO **BUSINESS**



Jonas Biörkman. Founder and CEO of Tessin

In Sweden, even conservative industries aren't afraid to embrace new ways of doing things.

ig delays and even bigger budgets. The construction industry has long had a reputation for inefficiency, but digitization is shaking up the building sector with Swedish firms leading the way. When the Swedish university town of Linköping was looking for financing to build new student hous-

ing, rather than seek a traditional bank loan, officials instead teamed up with crowdfunding platform Tessin.

"The municipality in Linköping wanted new ideas so with the developers we are building a new, creative environment there. The crowdfunding model means it is easier now to start a building project," says Jonas Björkman, Founder and CEO of Tessin.

"Construction has traditionally been a conservative industry: now we are the beginning of a radical shift."

Jonas Björkman, Founder and CEO

SINCE ITS FOUNDATION in 2014, Tessin has racked up EUR 75 million from 32,000 private investors for a range of building projects across Sweden.

"The banking regulations changed in Sweden, which meant that banks could not be too exposed to the real estate sector. We spotted a gap in the market for investors to get involved in the construction industry," Björkman explains.

An investor can get involved for as little as EUR 5,000 and typically hope to see a return on their investment within 12-24 months. The Vallastaden project in Linköping, where organic building materials are being

used to create smart and sustainable homes, attracted 156 investors and raised more than EUR 1,5 million using Tessin.

And financing solutions isn't the only part of the construction business being reshaped by digitization.

On the design side, technical drawings on paper and 2D models have been phased out to be replaced by Building Information Modelling (BIM). It's not just a catchy acronym but a new approach to construction where build-

ing data is recorded and processed in order to create an accurate 3D model that can be simulated and optimized, long before the foundations have even been dug.

One Swedish firm leading the way is BIMobject, headquartered in Sweden's third largest city, Malmö, which is currently undergoing a construction boom. The firm has



enjoyed rapid growth and has a simple but very effective business model: users can download and use their range of apps for free while BIMobject makes its money by charging the manufacturers to build their 3D product catalogue.

For example, on the BIMobject cloud are software products that enable a user to develop a model from scratch. However, it is more than just a flashy 3D model but an accurate simulation that factors in lead times and the maintenance life cycle, which can all be mapped out and analyzed in advance.

INTEREST FROM ABROAD has been quick to follow, with BIMobject inking deals to establish subsidiaries in Hong Kong and Japan as well as signing a contract with the British Ministry of Justice.

Swedish construction giant Skanska, which was an early convert to BIM, has gone digital to boost productivity. Noticing that time and money was being wasted by having everything moving in a static environment, Skanska USA used BIM software to optimize the movement of its' workers and tools on projects. The result? An estimated one hour extra in productivity per worker per day.

Tessin's Jonas Björkman believes Sweden is at the leading edge of a shift that will shake up the construction industry around the world.

Construction has traditionally been a conservative industry; now we are the beginning of a radical shift".



Managing digital transformation by embracing a 'culture of innovation'

Digitalisation is disrupting traditional business models and forcing companies to make the change or get left behind.

The digital transformation is forcing many businesses to reimagine the way they operate. With the confluence of technologies like the cloud, social media, and the analytics available from big data, the race is on for companies to keep up with connected consumers expecting a seamless digital experience.

Some of the most prominent examples include the digitalisation of products or services - such as Workaround, a digital platform for renting out under-utilized office space that is rewriting the commercial rental business model - and the emergence of a shared economy that allows people to engage across boundaries and easily access the resources of

There are so many new technologies coming together. At the same time, we have a changed behaviour in people want to share rather than to own, and where sustainability is becoming increasingly important", says researcher Robin Teigland, Professor at the Centre for Strategy and

Competitiveness at the Stockholm School of Economics. She uses the Swedish company Safello as an example of digitalisation in action. In 2015, the company, which offers safer ways to buy and sell the digital currency bitcoin, completed its funding campaign on the FundedByMe website

You might think the traditional banking and finance sector is safe, but it's not. There are a lot of players who develop new services, and lending peer-to-peer is increasing sharply.

Safello is proof of both increased interest in digital currencies and the ability to raise capital through crowdfunding. The project has been so successful that the company has been able to set up Sweden's first

The financial sector is just one example of the transformation that industries face through digitalisation. In this changing world, Dr. Teigland explains that ordinary businesses must adapt if they want to survive the transition

"But now it's possible to invite the market into the development process."

Robin Teigland, Professor at the Centre for Strategy and Competitiveness at the Stockholm School of

"Enterprises need a culture of innovation in which everyone has to participate," she says.

"Everyone should be encouraged to be forward thinking, and to network both internally and externally. Solve them in collaborations with other actors, like startup companies.'

To illustrate her point she mentions the US financial company Wells Fargo, which started an incubator to invite entrepreneurs to collaborate on new business ideas

70-80 percent of all new services coming out onto the market fail. But now it's possible to invite the market into the development process. It offers completely different opportunities for finding the right deals.

SWEDEN IDEAL FOR HI-TECH DISTRIBUTION



Larissa Zengerling, Senior Business Development Manager with VIU



Kenneth Melchior, Cluster Head Nordics at Zalando

Swedes love to shop online and e-commerce is becoming big business worth an estimated EUR 6.5 billion in Sweden alone.

aturally, the established Swedish retail giants, such as Ikea and H&M, attract lots of clicks from home shoppers. However, an increasing number of Swedes are spending their money online on purchases from abroad.

A recent report from Nordic postal firm PostNord found that 28 percent of all online sales in Sweden are made from foreign e-retailers, with most Swedes purchasing products online from Britain and Germany.

German e-commerce heavyweight, Zalando, is one such company that has capitalized on the Swedes' love of buying clothes online; fashion makes up 40 percent of all internet shopping in Sweden with Zalando's website one of the most popular.

So popular in fact that in 2017 Zalando chose Sweden to locate its first fulfillment centre in the Nordics.

"The Nordic e-commerce market is mature and developing fast," says Kenneth Melchior, Cluster Head Nordics at Zalando.

Zalando's 30,00 square-metre facility sits in the north Stockholm suburb of Brunna, about halfway between Stockholm's Arlanda Airport and the city centre, a location that ensures customers across the Nordics can receive their Zalando items quickly.

"Ensuring consumer satisfaction, shortening lead times, and providing a fashionable assortment are essential elements moving forward," says Melchior.

Zalando has since inked a deal with PostNord as its logistics partner in the Nordics.

"Having this setup in place (in Sweden), we are also thinking of future test pilots for innovative services such as return on demand," Melchior adds.

SWEDEN WAS RANKED the third-best country in the world for logistics performance in the 2016 World Bank Logistics ranking. And Sweden's high level of internet penetration means that 90 percent of Swedes shop online every year, spending an average of EUR 2,292 on the web annually.

Swedes also like to get their e-purchases fast and most have a three-day limit when it comes to receiving their goods, according to the PostNord report. The Swedish market is growing at a rapid rate with online sales set to fetch EUR 7.6 billion in 2018.

Another foreign firm keen to get a slice of the ecommerce pie is Swiss online eyeglasses retailer VIU. Shoppers can order four pairs of frames online and try them on in the comfort of their own home before deciding whether or not to buy.

VIU recently complemented their online presence with a flagship store in Stockholm. Embracing a nation of tech-savvy Swedes made it an obvious move for the Zürich-based company.

"Swedes are very used to online shopping and the infrastructure of the postal service stations make for a



prompted the creation of Sweden's first e-commerce park in Helsingborg, which is located in the south of the country. The port city is ideal for transporting goods while the e-commerce park has office space, warehouses, logistics center and an incubator program.

And with Amazon.se rumoured to be just around the corner, e-commerce looks set to go from strength to strength all across Sweden.





Niklas Arvidsson, Associate professor specialising in payment systems innovation at Stockholm's Royal Institute of Technology

FinTech is radically changing consumer behaviour. The question is: why has Sweden wholeheartedly embraced digital payments while the rest of the world is only just discovering them?

or several years now there has been a noticeable shift away from the use of cash in Sweden. Instead, FinTech payment solutions are so widespread that the whole country is well on its way to becoming the world's first cashless society.

Many shops, restaurants, cafes, and bars are cash-free - it's not uncommon to see "card only" signs next to most cash registers. Even the majority of bank branches, where you'd naturally expect to see paper notes and coins, are refusing to take cash deposits.

"Cash is still an important payment method in many countries, but that's no longer the case in Sweden," says Niklas Arvidsson, an associate professor at Stockholm's Royal Institute of Technology (KTH) specialising in payment systems innovation.

"Our use of cash is small and shrinking fast." Cash use has declined so much that the Riksbank, Sweden's central bank, has even considered introducing its own digital currency, the "e-krona", as a complement to cash.

According to the Riksbank, less than 2 percent of all transactions made in Sweden last year were made in cash. This figure looks set to drop even further to just 0.5 percent by 2020. Compare this to the global average of 75 percent and it creates a stark image of how little Swedes really use cash.

AS THE SECOND largest FinTech centre in the world, it's only natural that Sweden is one of the first countries to truly embrace the cash-free movement.

The ubiquity of several homegrown FinTech solutions, like Klarna, which provides payment services for online storefronts; Trustly, which enables you to shop and pay from your bank account; and iZettle, which allows sole traders and small businesses to accept card payments via a mini-card reader and app, it's unsurprising Swedes have been so willing to abandon cash.

Arguably the country's favourite digital payment solution is Swish, an immensely popular mobile app developed in cooperation with the country's largest

The app uses mobile numbers to allow anyone with a smartphone and a Swedish bank account to instantly transfer funds from one account to another. Just recently Swish reached a mammoth 5 million users, meaning it is effectively used by half of Sweden's population.

The widespread use of Swish has the potential to completely replace bills and coins, and thereby accelerate the process of making Sweden one of the first cashless societies in the world," says Arvidsson.

"Swish is like cash in that it's a direct payment that can be carried out in real time. The system's biggest



strength is the speed and simplicity of this unique solution."

DESPITE SWEDES' GROWING preference for cashless transactions, Arvidsson doesn't expect Sweden to go completely cashless until at least 2030.

But judging from the pace of investment and innovation in the country's FinTech scene, Sweden's cashless future may be closer than we think.

In the past five years, Stockholm-based companies received 18 percent of all private placements in FinTech companies across Europe. And Sweden's share of European FinTech deals climbed from 8 percent in 2016 to 12 percent in 2017, part of what Stockholm FinTech Hub founder Matt Argent calls a "seismic shift" in activity within FinTech in Sweden since the hub launched in February 2017.

"The country's tech unicorns are putting the country on the map as a viable destination for investment and this is influencing the FinTech sector," he adds.

"Swedish FinTech has attracted EUR 776 million in total funding, which translates to 279.38 percent average revenue growth, across 226 organizations employing 3038 employees - not bad going for a country of only 10 million inhabitants."

TREND-SETTING **FINTECH FIRMS**

One of Sweden's fastest growing companies, iZettle has developed a chip-card reader and app for smartphone-based mobile commerce that meets international security requirements. The company offers a range of financial products for small businesses including payments, point of sale, funding, and partner applications.

safello

SAFELLO

Founded in Stockholm in 2013, Safello operates a bitcoin exchange and related services in the European market and aims to become the "Crushbase of Europe". The company recently closed a partnership that allows customers to purchase bitcoin with Mastercard and Visa credit cards in several currencies around Europe.



This online payment service was developed by three students back in 2005 and now has 60 million users generating 650,000 financial transactions a day. The company has an estimated value of more than EUR 2 billion.



Tink is a personal finance app that helps users better track and analyze how they spend their money. Founded in Stockholm in 2012, Tink also offers bill payment and money transfer services. With more than 350,000 users in Sweden, Tink is expanding across Europe with help from investments from Swedish banks SEB and Nordea, as well as ABN Amro.



QAPITAI



Qapital is a free personal finance app that relies on "gamification" and personalized IFTT ('if this then that') rules connected to other apps that help users meet short-term savings goals. Founded in Stockholm in 2013, the company expanded to the United States in 2014 and soon after decided to focus exclusively on the US market.

FUNDEDBYME



FundedByMe is Swedish crowdfunding platform that connects investors and entrepreneurs, allowing people to invest as little or as much as they want. Founded in 2011, FundedByMe now has more than 100,000 registered investors and has helped 470 companies from 25 countries raise money. The fast-growing company has plans for an IPO during 2018.

Fintech funding

Since 2010, nearly 710 Million Euro has been invested into the Swedish FinTech sector

The digital Fintech ecosystem has grown by nearly 450% between 2009 and 2017

CAR PARTS, CARTILAGE, AND COCKTAIL DRESSES - ALL AT THE CLICK OF **A BUTTON**

What do stilettos, turbo-chargers and a human heart all have in common? No, they are not leftover props from a Stanley Kubrick film but things that can all potentially be created in a 3D printer.



Erik Gatenholm, Co-Founder & CEO of Cellink

dditive manufacturing, better known as 3D printing, has been around since the 1980s. However, it is only in recent years that the technology has become more mainstream with the fashion, automobile, and medical industries all taking advantage of the latest 3D printing innova-

Swedish firms were among the first to spot the potential of the technology. Supercar manufacturer Koenigsegg, based in Ängelholm in southern Sweden, 3D printed the turbocharger and titanium exhaust tip for its One:1 sportscar, which produces an astonishing 1360 horsepower.

A benefit of 3D printing is that it cuts down on costs and allows items to be made bespoke. For Koenigsegg, it was cheaper to 3D print the car parts (over three days) rather than make them in its factory. Despite saving money by going 3D, the sleek One:1 still costs around EUR 2 million.

AND THE PRICES of certain 3D printers are similarly eye-wateringly high, although costs have dropped significantly as more companies get in on the print revolution. Swedish startup Cellink knows that better than most as it has been making inroads in the market with 3D printers that cost as little as EUR 8,500.

But Cellink doesn't just make any old 3D printer.

No, the company is leading the way with 3D bioprinters - technology that can print human organs.

Cellink has been making global headlines with its bioprinters that use bioink, which is a mixture of liquid and human cells, to produce affordable bioprinters for a range of international research institutions such as Harvard University and University College London.

The company's Swedish co-founder, Eric Gatenholm, has ambitious plans to shake up the world of medicine and the medical community is certainly paying attention to this Swedish startup, which has grown rapidly since its founding in 2015.

Hearing aids have long been created in 3D printers but bioink can be used to produce skin and cartilage. Longer-term, the goal is to create fully-functioning human organs with the holy grail being a 3D heart; something that is forecast to occur within the next decade.

INTERNATIONAL FIRMS HAVE been swift to notice Sweden's ascendancy in the 3D printing market. Siemens is pumping in EUR 21.4 million to build a 3D printing workshop in the industrial Swedish town of Finspång. Slashing build times for projects and getting products on the market faster are just two of the key attributes that make 3D printing worthy of investing in for the German giant.



CHARGING AHEAD WITH **EUROPE'S** LARGEST 'GREEN' BATTERY **FACTORY**

After spending five years at the right-hand side of Tesla CEO Elon Musk. Peter Carlsson has returned to his native Sweden to build the world's greenest battery factory.



Peter Carlsson, CEO Northvolt

n 2016, Tesla alum Peter Carlsson announced plans to build Northvolt, a EUR 3.8 billion electric battery factory, in his home country of Sweden. The factory will rival his ex-colleague, Tesla founder Elon Musk's, "gigafactory" in Nevada, Texas, where production began in January 2017.

In October 2017 it was confirmed Northvolt's production facility will be located near the coastal town of Skellefteå in the industrial north west of Sweden. The first phase of the plant is predicted to produce 32 Gigawatt-hours when up and running in 2023.

THE "GIGAFACTORY" WILL be Europe's largest factory producing next-generation lithium ion batteries needed to power electric cars and other vehicles. The scale of the operation means the batteries can be built at half the current price, making electric cars accessible to more people and tackling Europe's carbon dependency.

"A growing consciousness of the urgency to mitigate the effects of climate change is accelerating the transition to a fossil fuel-free society," says Jesper Wigardt, Communications and Public Affairs Director at Northvolt.

"An increased use of batteries is one of the cornerstones in this transition, enabling massive conversion to sustainable transportation as well as a deep integration of renewable sources in the energy mix."

Driving the automotive industry away from oil and towards lithium-ion batteries will reduce its carbon footprint and make it possible to build affordable electric cars that perform at the same level, or better, as cars with combustion engines.

And Sweden is already a leader when it comes to green electricity, boasting a 97 percent fossil free, stable electricity supply with one of the lowest tariffs in Europe. For example, the CO emission per kWh produced in Sweden is less than 10 percent of a German produced kWh.

IN ADDITION SWEDEN has the highest share of energy production from renewables (53.9 percent) among EU member states.

Thus producing the batteries in Sweden gives them a lower carbon footprint than even before they are put into service to help reduce emissions.

"Sweden has a unique position to establish largescale battery production to support Europe's transition to renewables with its clean and affordable energy, proximity to raw materials, and a strong industrial tradition deep in its DNA," says Wigardt.

An associated research centre hiring 300 to 400 employees will also be established in Västerås, a city in central Sweden around 150 km west of Stockholm.

"The European industry is moving quickly towards electrification, and we believe all sectors that are determined to make the transition into renewable energy will benefit from our project," says Wigardt.

He adds that together the new factory and research centre will propel Sweden to the forefront of green battery production.

Sweden now has great opportunity to become one of the leading electrification clusters in the transition that is going to happen during the coming years."





One out of ten in the world has played a game developed in Sweden. Photo: Toca Boca

SWEDEN: A STAR PLAYER IN GLOBAL GAMING INDUSTRY

From north to south, Sweden is a hotbed of game development and home to big name players that are shaping the industry's future.

weden is home to the second-highest concentration of video-game studios per capita in the world, ranking among the world's top exporters of computer games, with household names like Candy Crush, Battlefield, and Minecraft developed on Swedish soil.

What's more, it's estimated that one in ten gamers around the world has played a game made in Sweden.

Indeed, there are more than 280 homegrown and foreign gaming companies operating in Sweden.

The majority are based in Stockholm, with gaming giants King, DICE, and Mojang headquartered in the capital, while around 25 are in Malmö, including awardwinning Massive Entertainment which is currently developing the upcoming game based on the Avatar universe.

But the industry isn't limited

to the south. In 2016, the Arctic Game Lab was founded to nurture a stable strategic platform and develop the gaming industry in northern Sweden.

Jacob Kroon, communications officer for the Swedish Games Industry, believes the gaming industry has grown so fast because of the robust synergy between incubators, education, startups, niche developers, bigger companies, and serial entrepreneurs.

"These synergies are engrained in our industry culture and create the right conditions for both small and large developers to grow."

And grow they have.

IN ITS MOST recent Index, the Swedish Games Industry reveals there has been a 1,000 percent increase in revenue of Swedish game developers since 2010. In 2016 alone, Swedish game developers turned over EUR 1.4 billion, Gaming in Sweden: by the numbers

number of studios

1.4 billion: annual turnover (EUR. 2016) 1000% increase since 2010 25% of sector made of SMEs 10% active in VR sector

doubling in the space of just three

"Swedish game developers are characterised by their wide range and high quality," says Kroon.

"We have world-leading developers within virtually all segments and on all platforms and markets."

He adds that almost 10 percent of Swedish gaming companies are developing virtual reality (VR) games, which have become something of a strength in Sweden with several high-profile international investments.

Kroon credits the gaming industry's continued growth and success to the broad-ranging talent ecosystem that calls Sweden home.

"Some of the world's largest developers and some of the foremost niche developers coexist here. There's also a growing number of industry veterans starting their own studios after long careers with the best game developers in Sweden."

YOUR PARTNER WHEN FINDING NEW VENTURES

Ready for the next big thing? We are experiencing a new industrial revolution that enables digitalized production, disruptive business models and multiple ways of meeting customers.

t creates new opportunities across all industries and value chains. In this issue of Advantage Sweden, you will find out why Sweden is a tech hub by nature and has been dubbed "the land of unicorns".

Effective collaboration and informal networks are some keys to the success.

"We support you every step of the way and act as a link to Swedish industries, organisations and companies." Sweden offers the competence, the resources and the markets to help international companies succeed when going digital.

Sweden invests in knowledge and have access to a young, welleducated talent pool. Sweden is also one of Europe's top spenders

when it comes to research and development.

Let us help you building your next big thing in Sweden, entering a strategic partnership or investing in a Swedish company. We support you every step of the way and act as a link to Swedish industries, organisations and companies.

Please contact us for more information about opportunities in Sweden and how we can be of assistance! invest@business-sweden.se



Ulrika Cederskog Sundling, Executive Vice President, Invest & Region Sweden Business Sweden

How we can help you

Business Sweden is the official Swedish trade and investment council. We help international companies to develop successful business in Sweden providing strategic advice, information and hands-on support - from initial evaluation of growth opportunities to final establishment, strategic partnership or capital investment. Services are free of charge and in full confidentiality.

MARKET AND INDUSTRY INSIGHTS

To build your business case and prove the value of an establishment or investment, we provide you with customised information and benchmarking services on the Swedish market, business climate, industry sectors, operating costs, legal framework and more.

BUSINESS OPPORTUNITY

Based on your sector priorities, our industry specialists identify and present market and industry opportunities in Sweden. We identify growth areas, key industry stakeholders, establishment strategies and next steps.

PARTNER SEARCH AND MATCHMAKING SUPPORT

We act as a link to Swedish companies and introduce you to opportunities of strategic partnerships, R&D collaborations and other types of cooperation.

ESTABLISHMENT SUPPORT

We provide you with information on how to set up and run a business in Sweden, including rules and regulations, legal entities, employment matters, taxes and more.

ACCESS TO BUSINESS NETWORKS

We introduce you to all necessary service providers, authorities and organisations.

SITE SELECTION

To help you find the right location and premises for your facilities, we coordinate site selection processes based on your requirements. Our regional and local network enables us to conduct site screening throughout Sweden and access detailed data.

WHICH REGION ARE YOU INTERESTED IN?

Business opportunities often relate to a skilled workforce, new customers, cost efficiency and local networks, such as innovation systems or clusters. The regional agencies can provide you with extensive local assistance throughout an establishment or expansion process.

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14,000 foreign-owned companies with 20 percent of the private workforce account for 50 percent of Swedish exports. Sweden attracts a large share of foreign direct investments.

Are you ready to establish and invest in Sweden? To start a company is quick and straightforward.

Sweden has a transparent system with minimal bureaucracy, no restrictions on foreign ownership or operations.

These are some of the reasons why international rankings has listed Sweden in top for countries to do business in.

Read more at www.business-sweden.com



We help Swedish companies grow global sales and international companies invest and expand in Sweden.



