

What's Happening

THINK LUXEMBOURG

Data-driven innovation



CLOUD &
ICT SERVICES



M2M MANAGED
CONNECTIVITY



INTERNATIONAL
CONNECTIVITY

Connect cars easily with our M2M/IoT turnkey solutions.

Already more than 2 million M2M SIMs connected worldwide.

For more information contact us via www.posttelecom.com



Let's try it now !
Request your free
IoT Starter Kit here



Welcome

Our economy is being fundamentally transformed by access to an ever-increasing amount of data. Numerous new services that bring greater economic value and improve our daily lives have already been created, but there is potential to do so much more.

Already considered a digital forerunner because of its highly digitised and innovative economy, Luxembourg aims to become one of the most advanced data economies in the world. The Government's data-driven innovation strategy for a trusted and sustainable economy and its artificial intelligence strategy lay out a clear framework to reach this goal. The aim is not only to provide an environment where new technologies can be tested and applied, but also where all kinds of digital businesses can prosper and expand within the broader European and global markets. Big data offers a complete picture with real-time information that can help policy-makers and businesses take better decisions provided that the right data governance is in place to guarantee the protection of privacy, personal freedoms and intellectual property.

This edition of *Happen* magazine, lays out the Government's strategies and shows how they are being implemented. Luxembourg's business-oriented high-performance computer, its partnership with global artificial intelligence leader NVIDIA – the first of a kind in Europe – and its pioneering efforts in the development of cybersecurity standards are among the key projects featured. New opportunities brought about with digitalisation in smart mobility, logistics and supply chain management are featured in this edition. Last but not least, Luxembourg's maturing start-up ecosystem will be laid out.

For 35 years, Luxinnovation, the national innovation agency, helps companies adopt digital technologies and use them to enhance their competitiveness and contribute to a sustainable economy. We do so by listening to companies, understanding their needs and helping them to overcome the hurdles they are facing. Innovation is a means to an end. Our agency is an innovation facilitator for all types of companies who want to be at the forefront of a sustainable and successful economy. As such, we welcome entrepreneurs from all over the world looking for an environment that is receptive to their needs and that shares their ambition of sustainable development. **X**



Sasha Baillie
CEO of Luxinnovation



LEGALIS

A FORWARD-THINKING LAW FIRM

Legal intelligence
for smart decisions

**INVESTMENT MANAGEMENT ♦ DISPUTE RESOLUTION MANAGEMENT
GLOBAL TAX MANAGEMENT**

LEGALIS

93, Route d'Arlon L-1140 Luxembourg
info@legalispartners.com - Tel: +352 20 60 11 55

WWW.LEGALISPARTNERS.COM

Happen

THINK LUXEMBOURG

Impressum

Published by Luxinnovation
in collaboration with
Maison Moderne

 **LUXINNOVATION**
TRUSTED PARTNER FOR BUSINESS
www.luxinnovation.lu

Editors in chief
Jean-Michel Gaudron and Lena Mårtensson

Contributors
Sue Hewitt
Jonas Mercier
Marine Mombelli

 **MAISON MODERNE**

www.maisonmoderne.com
agency@maisonmoderne.com

© Maison Moderne™
Maison Moderne is used under license by
MM Publishing and Media S.A. [Luxembourg].

© 2019 Luxinnovation. All rights reserved.

Any reproduction or adaptation, either
partial or total, is strictly prohibited
without the express written authorisation
of Luxinnovation.

If you do not wish to receive
Happen magazine in future,
please send an email to
communication@luxinnovation.lu

To subscribe to our regular newsletter
and other online updates about Luxembourg
as an ideal business location,
please visit www.tradeandinvest.lu

Benchmarks 06

Nine facts about Luxembourg

News 14

What happened in Luxembourg?

Smart Mobility 42

Enabling the wide-scale transformation of mobility

LOGISTICS AND 60 SUPPLY CHAIN MANAGEMENT

The digital future 62

Transforming 66 supply chain services

Meet the decision-makers 72

Life in Luxembourg

08 Interview
Xavier Bettel:
“Artificial intelligence
for the benefit of all”

22 DATA-DRIVEN INNOVATION

24 Étienne Schneider:
“Becoming a leading data economy”

32 First-rate infrastructure
for the data economy

36 Cybersecurity:
a secure hub for data

40 Luxembourg Digital
Innovation Hub

41 Strategies for the digital era

48 START-UPS

50 A brand for an innovative
ecosystem

52 A multitude of challenges

55 “Developing synergies with
incubators abroad is a priority”

56 They made it from Luxembourg

58 Creating the right atmosphere
for each start-up

68 Local door openers for business

78 Innovation
It happened 1st in Luxembourg

NINE Facts

about Luxembourg



1. After innovation leaders Sweden, Finland, Denmark and the Netherlands, Luxembourg has the **5th best innovation performance** in the EU. **X**



2

2. Due to the wide availability and increasing adoption of fast and ultrafast fixed and mobile broadband networks, Luxembourg ranks **2nd in the EU in terms of connectivity**. **X**



3. Luxembourg passport holders can travel to **186** different countries and its citizens have a high level of personal freedom: these are the main reasons why the **Luxembourg passport is ranked #1 in the world**. **X**

Sources: 1. 2019 European Innovation Scoreboard / 2. The Digital Economy and Society Index 2019 / 3. Nomad Passport Index 2019



4. Luxembourg is listed as the **7th most resilient country in the world** (out of 130 countries). The country ranks particularly well in the economic sub-category [2nd]. **X**



5. Luxembourg ranks **12th most competitive economy** in the world (out of the 63 ranked economies). The country ranks particularly high in the category "Economic performance" [4th]. **X**



6. With a GDP per hour worked of \$93.6, Luxembourg had the **2nd highest labour productivity** among the world's most mature economies in 2018, just after Norway. **X**



7. For the third time, Luxembourg ranks **#1 among the countries that are most "open for business" in the world**, due to its favourable tax environment, transparent government practices and low level of corruption. **X**



8. Luxembourg ranks **#2 out of the best countries in Europe to raise a child**, and #1 in the sub-category "Health & Safety". **X**



9. Luxembourg is the **safest city in the world**. Overall, it ranks as the 18th best city in the world in which to live. **X**

4.Global Resilience Index 2019 / 5.IMD World Competitiveness Ranking 2019 / 6.The Conference Board Productivity Brief 2019 / 7.U.S. News & World Report's 2019 Best Countries study / 8.NimbleFins, Best countries in Europe to raise children / 9.Mercer's 2019 Quality of Living City Ranking

XAVIER BETTEL

Artificial intelligence for the benefit of all

In May 2019, the Luxembourg government presented its strategic vision for artificial intelligence. The main priority of the Prime Minister and Minister for Digitalisation is to ensure that this extremely powerful technology will bring advantages to everyone – businesses, research centres and individual citizens.

Text by Lena Mårtensson >

Photographs by Patricia Pitsch [Maison Moderne] >

Illustrations by Maison Moderne



Why did the government decide to develop this strategic vision for artificial intelligence?

Xavier Bettel: Artificial intelligence (AI) is no longer just a theoretical concept or a research field – it has become a reality and part of our daily lives. The amount of data available is multiplying with incredible speed, but it is only valuable if we can extract useful information from it and use it to provide concrete solutions to real issues. AI is the key for doing this. For the first time ever, we can tap into global intelligence and use it to solve local problems.

Our government is committed to steering the development and use of AI in a direction that benefits our citizens. Luxembourg has a unique ability to become a living lab for real-life AI applications. The country can also become a forerunner for AI regulations that put people first. We want to see AI weave smoothly into the fabric of society, improve the lives of all citizens and strengthen us as a nation and member of the global community.

You consider this strategic vision as a national priority. What does this mean in concrete terms?

We want to actively shape the way artificial intelligence is used in our country. Luxembourg's commitment to AI goes well beyond just supporting applied R&D projects. We want to be at the forefront of this development by optimising the national data market, facilitating the development of skills, boosting investment and collaborating across borders. We believe that we can make a difference on a global scale. As a diverse, innovative nation, we can define what impact this technology will have on human rights, on people's lives and on our democratic values.

This vision is not only a one-off strategy. We see it as a first step to developing a holistic policy vision that will be updated and further defined on a regular basis. An inter-ministerial coordination group, led by myself, will regularly assess the state of play and implementation of the strategic vision. We are advised by a committee of experts in law, science, technology, ethics and humanities, and plan to invite members of the public to

WHO IS HE?

Name

Xavier Bettel

Born

3 March 1973

since 2013

Prime Minister, Minister for Communications and Media

Xavier Bettel is a Luxembourg politician and member of the Democratic Party (DP). He was elected to Parliament for the first time in 1999. A barrister by profession, he became mayor of the City of Luxembourg in 2011. Following the legislative elections in 2013, he was appointed Prime Minister, Minister of State, Minister for Communications and Media and Minister for Religious Affairs. He once again took on the role of Prime Minister after the 2018 elections, and was also appointed Minister for Communications and Media, Minister for Religious Affairs, Minister for Digitalisation and Minister for Administrative Reform. [X](#)

participate through public policy consultations.

Do you target specific sectors, or does the vision consider all kinds of AI developments?

AI will have an impact on a wide range of sectors, and individuals can benefit from it through assisted living, decision-making, health care, mobility and much more. If artificial intelligence is used to treat the huge amount of mobility data that is collected every day, for example, it can help make travel safer, support traffic management and provide useful information on the most efficient modes of transport.

AI is an essential tool for setting up smart cities offering sustainable solutions, such as optimised building efficiency, waste management and energy consumption and storage. AI-supported diagnoses and treatment procedures will also bring preventive healthcare to the next level and enable the implementation of personalised healthcare – a major Luxembourg priority. In addition, AI has the potential to simplify citizen-government interactions by providing access to efficient, transparent and customer-centred public services.

Artificial intelligence can seem frightening, especially as future developments could have a negative impact on humankind. How can we ensure that this influential technology will not be used to the detriment of human values?

AI is indeed at the brink of becoming generally accessible and applicable in industry as well as in other aspects of society, such as education, environment and art. As with any other high-potential technology, the use of AI will have far-reaching consequences and experience some growing pains.

Integrating AI into existing workflows, for example, may raise new questions related to working conditions, employment law and labour relations. The increased automation of previously manual tasks brings challenges, but at the same time, there is a great potential to create new jobs. These will probably require a completely different skillset, however, which could potentially lead to a polarisation

“Luxembourg has a unique ability to become a living lab for real-life AI applications.”

of the labour market. The inclusive labour market policies that our government pursues are vital to ensure that nobody is left behind. Another challenge is that in many cases, AI services rely on the use of personal data. Cybersecurity and data privacy are already at the top of the government's priority list, and they obviously remain critical in the context of AI.

The government's human-centric strategic vision makes it very clear: the individual should be at the centre of all AI services that we support in Luxembourg. After all, we do not encourage digitalisation and new technologies for their own sake, but for their capacity to improve our daily lives. We aim to raise awareness and help citizens develop a deeper understanding of AI in order to transform them from passive consumers to active users of AI-related products, services and technologies.

As you just mentioned, we know that as a result of AI, new jobs will emerge while others disappear. What is your vision of training and skills development? What kind of profiles do you want to attract to Luxembourg?

Over the past ten years, Luxembourg has attracted excellent researchers and talents to build a solid foundation for AI expertise. As the use of this technology is now increasing in various profes-

sional fields, we need to anticipate the future needs for skills and invest significant sums in lifelong learning and specific digital and AI-related training programmes. The aim is to help companies and their employees, as well as the unemployed, successfully adapt to the changing labour market.

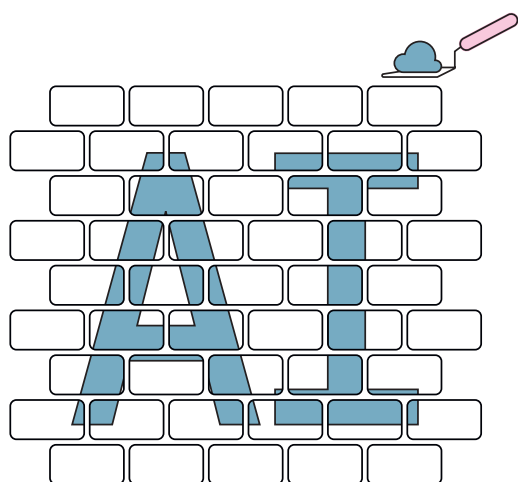
In spring 2018, the government launched the Luxembourg Digital Skills Bridge initiative that addresses these points. As a next step, we will map the national education offer to ensure that AI is integrated into other disciplines such as law, business, human sciences, environment and health. We are also looking into best-practice methods regarding how to reinforce excellence, retain AI talent in Europe and attract more women to AI studies.

What investments has the state already made for developing AI-related projects, and what is planned in the coming years?

We have invested heavily in international connectivity, IT infrastructure and innovative projects for the past 15 years, and often engaged in strategic partnerships. The Luxembourg Commercial Internet eXchange (LU-CIX) encompasses a network of six data centres and provides the groundwork for high-speed, high-volume data transfers, blockchain initiatives and cybersecurity measures.

The country's high performance computing initiative strives to open up access to extensive computer resources and expertise to a broad range of players. The intention is to lower the entry barriers for AI-based products and services by mutualising costs and pooling scarce skills. We also want to create synergies between new public investments in R&D and innovation and infrastructure related to AI activities – for instance, by launching initiatives similar to the 5G pilot zones that will be emerging in Luxembourg over the next few years. 5G will enable more connectivity in all aspects of life, such as home, mobility, health and industrial production.

Our R&D investments largely focus on applied research with international multidisciplinary centres of excellence in the fields of biology, >



“Over the past 10 years, Luxembourg has attracted excellent researchers and talents to build a solid foundation for AI expertise.”

cybersecurity, networking and trust. The National Research Fund provides funding for public-private research collaboration on topics like advanced robotics, digital manufacturing, improved design tools and enhanced perceptual capabilities in AI systems. It also supports technology sharing and encourages the creation of research-based spin-offs.

In general, we want to develop new partnerships with leading firms to grow the number of AI solutions and skills accessible to the Luxembourg ecosystem. One example is our ongoing partnership with AI-expert NVIDIA, which has led to the creation of a joint AI laboratory in Luxembourg.

Luxembourg is not an island. How is the country's cooperation with major technological partners in neighbouring states structured? What are the contributions of each party?

Luxembourg has indeed a long-standing tradition of active participation in new EU initiatives, and I want to reiterate our commitment to investing in European AI-related collaborations. We intend to actively support high-quality networks of European AI research centres and take part in key community and cross-border initiatives, such as AI-powered Earth observation or the development of a shared database of health images. Luxembourg aims to promote and adopt international standards in the field of open data and facilitate the interoperability between data catalogues. Another priority is to analyse the feasibility of sharing and building AI expertise in strategic development cooperation countries. We also want to learn about best practices from countries with mature AI-related projects and establish research-based collaborations.

However, the ambitions of international partnerships go even further than this. The new 2030 general development cooperation strategy, focused on the sustainable development goals of the 2030 agenda, envisages knowledge transfer on AI solutions in order to contribute to eradicating extreme poverty and promoting sustainability. This powerful technology is bursting with opportunity – what this means exactly and what we do with it is up to us. **X**



— WHERE TOMORROW BEGINS —

Some dream.
Some discover.
Some change the world for the better.

We connect it all.

At LIST, we build the bridges that connect the world of academia with the real change that's happening in the market. It's research and innovation made in Luxembourg. And it's at your service.

LIST.lu

* detail of LIST's work on digital twin applications

LUXEMBOURG
INSTITUTE OF SCIENCE
AND TECHNOLOGY



What **HAPPENED** in Luxembourg



Hosting the next Cleantech Forum Europe, opening an innovative pavilion at the World Expo in Dubai, facilitating access to space data, it is all in the latest news roundup on innovation in Luxembourg.

LOW COST Luxembourg ranks 84th on Mercer's 2019 *Cost of Living City Ranking*, well behind European neighbours such as London [23rd] or Paris [47th]. This study is based on parameters such as the price of rent, food, transport, tobacco, services and healthcare.

EVENT



2020 Cleantech Forum Europe in Luxembourg

Luxembourg has been selected to host the 2020 edition of the Cleantech Forum Europe, a major international event in the field of clean technologies. The forum will provide excellent opportunities for the exchange of ideas on the latest cleantech trends with leading stakeholders from all over Europe. It will also showcase Luxembourg's most dynamic organisations and projects in the field.

Promoting clean technologies and the transition towards a circular economy is a priority in Luxembourg. The country also offers an attractive economic environment for entrepreneurs who are keen to create value whilst reducing pollution, waste and energy consumption.

This is the reason why the Ministry of the Economy, Luxinnovation and Luxembourg for Finance have put forward a proposal to host the 2020 edition of the event in Luxembourg. "We will be able to show a lot of interesting initiatives," explains Jean-Michel Ludwig, Luxinnovation's Director of Business Development. "For example, next year, we will be the first country in the world where people can travel everywhere in the country by public transport completely free of charge." X

www.cleantech.com/event/cleantech-forum-europe/

WHO SAID WHAT?

"Luxembourg's best performance in the *Digital Economy and Society Index* is in Connectivity, in which it now ranks second among EU countries."

Digital Economy and Society Index (DESI), 2019 Luxembourg Report

"Luxembourg is poised to play a pioneering role in the development of a commercial space economy."

Étienne Schneider
Deputy Prime Minister
and Minister of the Economy

"The establishment of new start-ups with high added value contributes to Luxembourg's economic diversification and growth."

Mario Grotz
President of Luxinnovation

DID YOU KNOW?

2.4%

This is Luxembourg's GDP growth forecast for 2020 [source: National Institute of Statistics and Economic Studies of Luxembourg].

€3 billion

This is the amount that the European Innovation Council [the new European financial instrument] plans to distribute by 2020 to enable the most talented innovators to help their companies scale up and expand internationally.

10,000

This is the distance, in kilometres, from the direct freight rail link inaugurated in October between Luxembourg and Chengdu [China].

OPEN ACCESS



Promoting access to space data

At the Space Forum in May 2019, the young Luxembourg Space Agency (LSA) announced the creation of the LSA Data Center. Its goal is to support businesses in Luxembourg with reliable, fast and intuitive access to data streams from the European Copernicus Earth Observation programme. "This LSA initiative is just a first step to facilitate access to space data with the aim of stimulating new services provided by Luxembourg as a hub for commercial space in Europe," explains Marc Serres, LSA's CEO.

The data centre will promote the development of products and services which rely on constantly updated Earth Observation data.

The detailed optical and radar imaging data has many possible uses of potential interest for various

sectors: environment, maritime, meteorology, agriculture, mobility, aviation and health. The information is provided on a full, free and open access basis.

"This initiative is just the first step."

The LSA Data Center is fully aligned with the objectives of the Ministry of the Economy to support the further emergence of a trusted data-driven economy in Luxembourg and accelerate the digital transformation of its strategic sectors including the space industry itself. **X**

www.collgls.lu

Patents
Trademarks
Designs
IP Training courses
IP Contracts
IP Audits
Domain names
IP Strategy
IP Litigation
IP Valuation
Copyright

Winning Intellectual Property Strategies

We provide in-depth advice and service to vigorously protect our clients' rights and interests, at European and worldwide levels. Our philosophy is that IP rights are tools, which must be able to furnish a return on investment.

Office Freylinger SA
European Patent and Trademark Attorneys
234, route d'Arlon • P.O. Box 48
L-8001 Strassen • Luxembourg
Tel.: +352 313 830-1
office@freylinger.com
www.freylinger.com

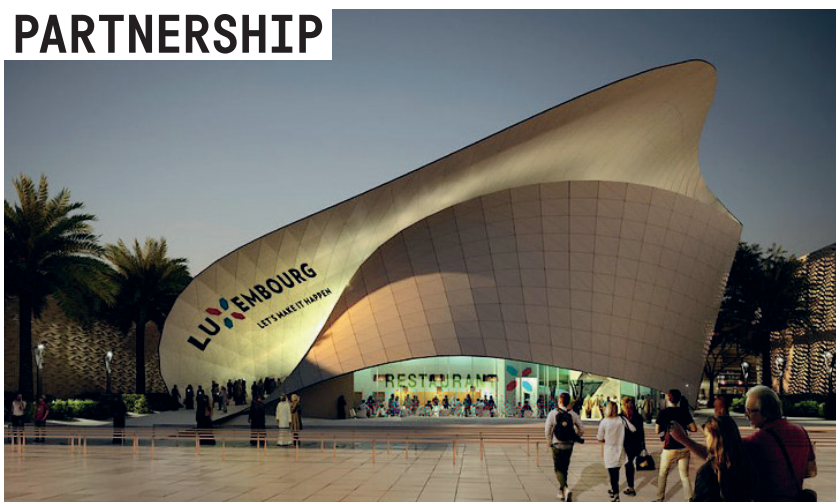


WHO IS HE?

François Lafont is the first CEO of the new Luxembourg Convention Bureau, a partnership between the City of Luxembourg and the Ministry of the Economy. This organisation has just been created to enable the Grand Duchy to join the top 50 countries that host the most events in the world, according to the International Congress and Convention Association ranking. Mr Lafont, 55, was for the last ten years Deputy Director of Congress & Events at the Tourism, Meeting Industry & Economic Development Agency of Toulouse [France]. "Luxembourg has the infrastructure to host European or global events," he explains.



PARTNERSHIP



Connecting minds, creating the future

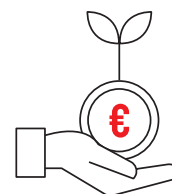
Luxembourg will be present with a pavilion of more than 2,700 m² at the World Expo 2020 in Dubai (from 20 October 2020 to 10 April 2021), the first edition to be held in the Middle East. Luxembourg's presence was prepared a long time ago, since the country was the first foreign nation to break ground for its pavilion in April 2018. Under the main theme "Connecting Minds, Creating the Future", the World Expo aims to promote innovation and sustainable development. This is perfectly in line with Luxembourg's national economic diversification policy, particularly with regards to the space sector and information and communication technologies. The scenography

inside the three-storey pavilion will focus on the theme "Resourceful Luxembourg" and will highlight the concepts of diversity, connectivity, sustainability and boldness. Emphasis will also be placed on the country's natural beauty, Luxembourg's entrepreneurial ability to reinvent itself and its commitment to sustainable growth. The pavilion will host a varied programme of economic and cultural events. In addition to a series of thematic missions related to specialised fairs, a "Made in Luxembourg" week will be organised to promote Luxembourg products. Artists will also exhibit their works in the pavilion. X

www.luxembourgexpo2020dubai.lu/en

€160 million investment by Euro-Composites

Composite materials specialist Euro-Composites, which employs almost 1,100 people worldwide (850 in Luxembourg), will invest €160 million in its Luxembourg site in Echternach. It will extend its production halls and acquire new state-of-the-art equipment during the period 2020-2030.



STARTUP IN LUXEMBOURG?

Join the Luxembourg-City Incubator at the House of Startups

Offices adapted to your needs:

- 150 stations available in a space of 2000m²
- Open coworking space
- Closed offices for teams of 4 – 10 people

Gain access to a plethora of networks, experts and consultants:

- Access to a consultation space with qualified professionals
- Access to the national and international networks of the House of Startups

Profit from the ideal office location:

- 3 minute walk from the central train station
- 5 minute walk to the city centre
- Connections to all public transport

More benefits:

- Open 24/7
- Possibility to establish your head office
- Rooms for meetings, workshops, conferences, etc.

Contact us:

info@cityincubator.lu
www.cityincubator.lu

   Luxembourg-City Incubator

powered by



sponsored by



PARTNERSHIP



A joint clean-space initiative

During the visit of Luxembourg's Deputy Prime Minister and Minister of the Economy, Étienne Schneider, to the NorthStar Earth & Space headquarters in Montreal in July, a cooperation was launched on a clean space initiative aimed at fostering sustainability in space. This initiative will evaluate the use of NorthStar earth and space information services with the support of Luxembourg's insurance, financial and satellite operator communities. Together these stakeholders hope to address some of the key issues related to space traffic management, sustainable commercialisation of space activities, insurance products for space operations to promote growth in

commercial space activities, and satellite operational challenges. NorthStar's mission is to empower humanity to preserve the planet by putting into place a unique space and earth information platform dedicated to space-based space situational awareness (SSA) and earth intelligence. Starting in 2021 and based on a satellite constellation equipped with hyperspectral, infrared and optical sensors, this platform will operate continuously from space, imaging, digitising and analysing the details of earth's ecosystems and surrounding orbit on a daily basis. **X**

www.northstar-data.com

Morocco highlight A new Luxembourg Trade & Investment Office will open soon in Casablanca [Morocco]. It will be the first one on the African continent, which represents a high-potential market for the development of the Luxembourg economy. The office will support companies looking to invest in the Grand Duchy and Luxembourg businesses wishing to expand their international activities.

WHO IS SHE?

Prof. Dr Tonie Van Dam, vice-rector for strategic projects at the University of Luxembourg, was honoured in May 2019 with the Vening Meinesz Medal, established by the European Geosciences Union [EGU] for distinguished research in geodesy. The award was in recognition of her pioneering work on the deformations of the solid Earth under a variety of surface loads and on their measurements using space geodetic observation techniques. Dr Van Dam, who has published more than 120 national and international articles, also received the Grand Prix 2017 in Geological Sciences from the Institut Grand-Ducal in Luxembourg.

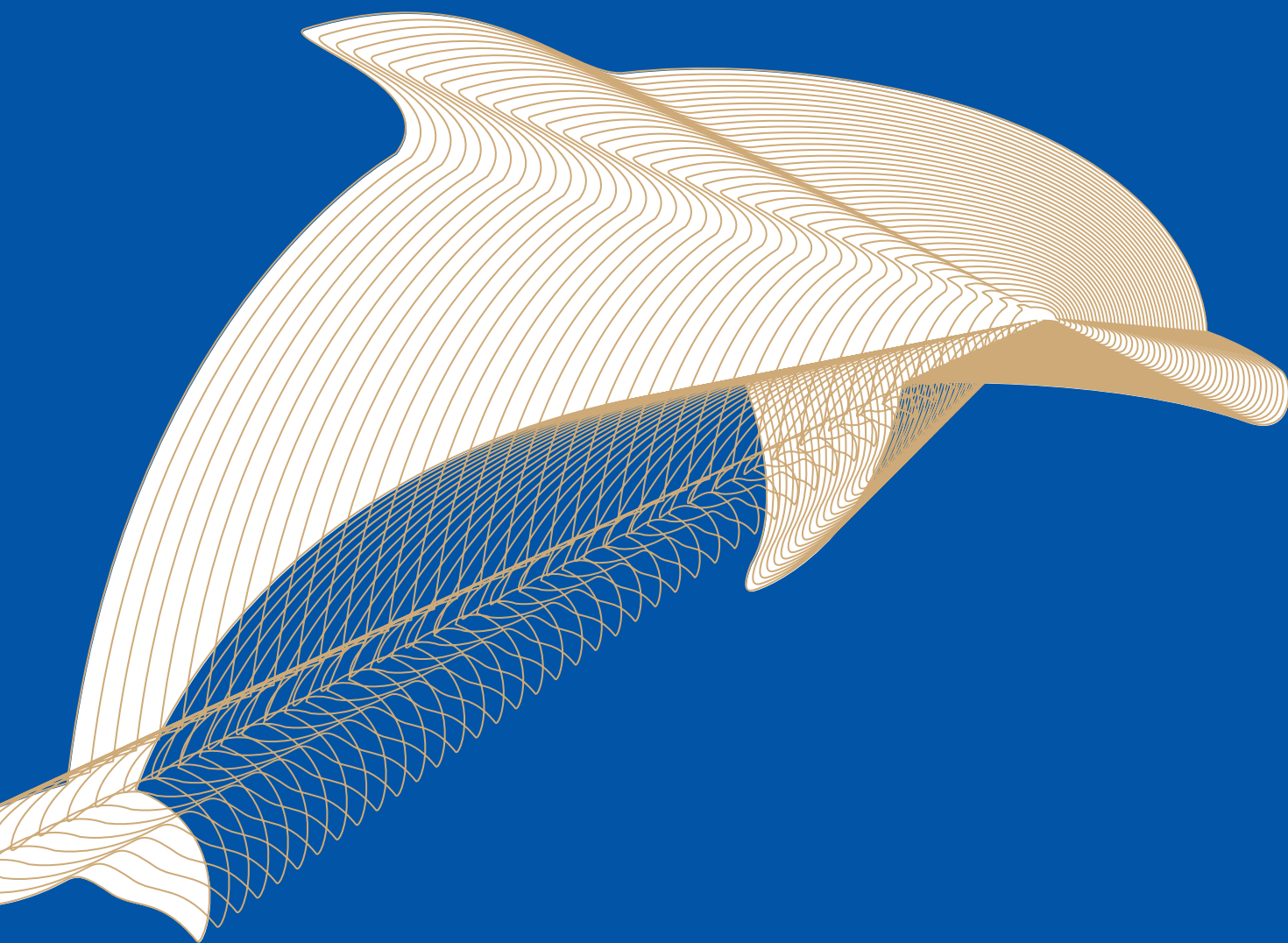


Illustration by Jan Hanrion (Maison Moderne) / Photograph from Unsplash

Partner up with
public research
for your next
industry 4.0
or space project!

**BRIDGES & INDUSTRIAL
FELLOWSHIPS**

*Research helps you innovate
and stay competitive!*



www.fnr.lu/ppp



Fonds National de la
Recherche Luxembourg

DATA- DRIVEN INNO- VATION

24
Étienne Schneider:
"Becoming a leading data
economy"

48
Luxembourg Digital
Innovation Hub

32
First-rate infrastructure
for the data economy

41
Strategies for
the digital era

36
Cybersecurity:
a secure hub for data

Text by Lena Mårtensson > Photographs by Jan Hanrion [Maison Moderne] >
Illustrations by Maison Moderne

IC105



Digest:

In May 2019, the Luxembourg government presented its strategy for data-driven innovation aimed at making Luxembourg the most trusted data economy in Europe. The strategy has three focus areas: continuing the investments in the country's top-notch digital infrastructure, supporting businesses in the adoption of innovative digital technologies and creating a favourable legal and financial environment. Luxembourg's business-oriented petascale high performance computer will be operational in 2020, and the country has set up the first European partnership on artificial intelligence with global AI leader NVIDIA. Widely recognised as a centre of excellence in cybersecurity, Luxembourg is at the forefront in fields such as electronic identification and cyber insurance. It is also developing innovative solutions for the de-identification of personal data in order to allow companies to create business value from secure data lakes. Well aware that openness to international companies has always been a key success factor, Luxembourg offers a unique and dynamic environment for high-potential digital activities where innovative ideas can be transformed into successful business. X

TCL-V2

C706

RTC27

R30



Becoming a leading data economy

ÉTIENNE SCHNEIDER

Luxembourg is determined to become Europe's most-trusted data economy over the next few years. The Deputy Prime Minister and Minister of the Economy outlines the government's plan to achieve this, set out in the recently released strategy for data-driven innovation.



Why did the Luxembourg government decide to develop a strategy for data-driven innovation?

Étienne Schneider: Digital and data-enabled technologies are influencing all aspects of today's society: they shape our way of working and communicating with each other, to the point of transforming our lives. As digital technologies are being deployed across all economic sectors, they have a particularly strong impact on the development of the economy.

Data-driven innovation revolutionises how we do business and makes it possible to deliver solutions with unprecedented speed and flexibility, often while also reducing the overall costs and decreasing the environmental impact.

Boosting the digital transformation of the national economy is therefore a priority for the Ministry of the Economy. Our "Data-Driven Innovation Strategy for the Development of a Trusted and Sustainable Economy in Luxembourg" outlines the government's vision for digitalising our priority economic sectors. The strategy addresses the projects and policies that the ministry will leverage in order to support the emergence of a trusted, data-driven economy in Luxembourg and accelerate the digital transformation of strategic sectors.

Where is Luxembourg in this field today, and what do you see as the main opportunities for the future?

Luxembourg identified information and communication technologies (ICT) as crucial for the successful diversification of the country's economy more than 20 years ago. Since then, major infrastructure investments have been made, notably in extensive broadband networks, outstanding international connectivity and state-of-the-art high-end data centres.

Today, the country enjoys solid foundations for facing future ICT-enabled opportunities and challenges. With its competitive business environment and smart policies, Luxembourg has all the assets needed to be an innovative forerunner in the data-driven economy and a perfect location for digital activities in general.

Our current focus is on seizing the opportunities provided by digital technologies to create the ➤

WHO IS HE?

Name

Étienne Schneider

Born

29 January 1971

2012

Minister of the Economy and Foreign Trade

Since 2013

Deputy Prime Minister, Minister of the Economy

Étienne Schneider is a Luxembourg politician and member of the Luxembourg socialist workers' party [LSAP]. After having worked as a Senior Government Advisor to the Ministry of the Economy and Foreign Trade, he was appointed Minister of the Economy and Foreign Trade in 2012. In the government formed following the 2013 general elections, he was Deputy Prime Minister, Minister of the Economy, Minister of Internal Security and Minister of Defence. In the current government, in place since 2018, he is Deputy Prime Minister, Minister of the Economy and Minister of Health. **X**

digital economy of tomorrow. The strategy is built on a holistic approach to digital transformation. It does not only include adopting strategic technologies, but also developing appropriate skills, building relevant infrastructure and ecosystems, and designing efficient policies and support measures.

Has the strategy been inspired by any observations from other countries?

The emerging data economy provides opportunities as well as competitive challenges for all countries. Those that are best prepared and equipped to compete digitally will also come out best. Over the next decade, digital data, infrastructure and knowledge will become strategic economic and competitive assets in advanced nations across the world.

In the European Union, the establishment of a digital single market is a prerequisite for attracting investments in the field of digital innovation and accelerating the growth of digital business. The European Commission has initiated an ambitious strategy for shaping the digital single market, based on a series of actions related to the European Cloud Initiative and the digitalisation of European industry.

The European digital agenda focuses on areas such as supercomputers, artificial intelligence, cybersecurity and digital skills. Luxembourg has chosen to align with these priorities. Our digital innovation strategy thus leverages and builds on the EU's digital policy and investments.

Which sectors are prioritised in the strategy?

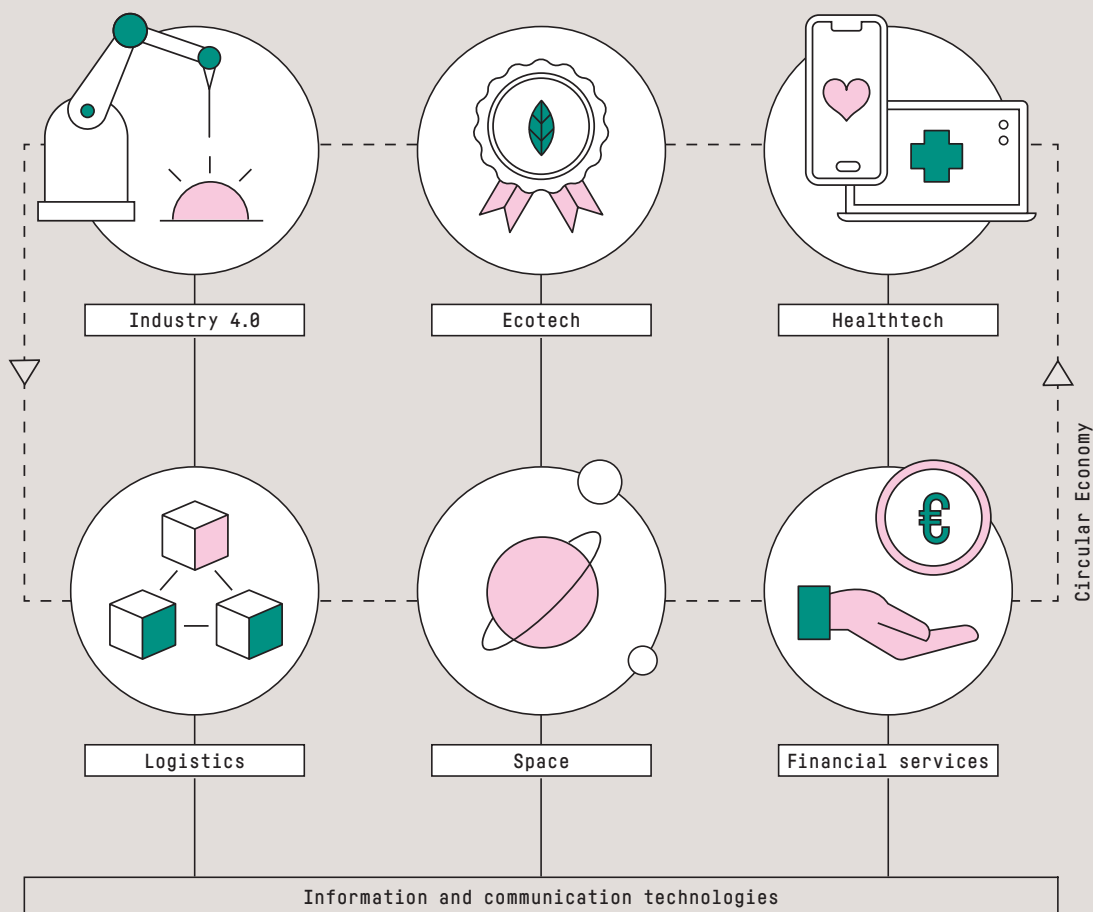
More than ten years ago, the government adopted a multi-specialisation strategy to further develop and diversify the national economy and better complement the strong financial sector. In order to achieve critical mass and impact, the strategy focuses on selected priority sectors: ICT, industry 4.0, health technologies, logistics, the space sector, eco-technologies – with a strong emphasis on the circular economy and smart mobility – and financial technologies.

The data-driven innovation strategy has three major focus areas: strengthening the digital **>**

PRIORITY SECTORS IN THE DATA-DRIVEN INNOVATION STRATEGY

MULTI-SPECIALISATION

The strategy includes sector-specific innovation plans and policies for the following sectors:



Source: Mapping by

“We offer a unique, secure environment for high-potential digital activities where innovative ideas can be transformed into successful business.”

infrastructure, supporting businesses in the adoption of innovative digital technologies and creating a favourable legal and financial environment for the data economy. It describes the current situation and context of each of these sectors, and proposes concrete actions aimed at increasing their productivity and ensuring their sustainable development in the data economy.

The ICT sector obviously has a transversal impact on all other areas, as digital technologies act both as an enabler and as a driver for the rest of the economy. We also expect the positive effects of the strategy to go well beyond the selected priority sectors.

What main actions and initiatives will be or are currently being implemented?

We officially launched our Luxembourg Digital Innovation Hub (L-DIH) – a key element of the data-driven innovation strategy – at the end of September. Its mission is to actively contribute to the digital transformation of the economy by supporting companies in their strategic thinking and concrete actions. Hosted and managed by Luxinnovation, the national innovation agency, the L-DIH will facilitate contact between companies that need access to digitalisation skills, technologies, services and support actions, and service providers who can meet their needs.

Another concrete achievement is the implementation of a high performance computer (HPC) in Luxembourg that will be operational in 2020. With a calculating power of 10 petaflops/second, it has been designed to meet the needs of companies, in particular SMEs and start-ups. A dedicated competence centre will advise and support less experienced users with their projects. The HPC will also be used for research purposes.

When it comes to projects by individual companies that fit into our data-driven innovation strategy, I would like to mention the “Factory of the Future” project launched by Husky Injection Molding Systems in February this year. This project, and the fact that Husky chose to implement it here, confirms that Luxembourg is an attractive location for high-tech industrial investments done by international groups. It is a tangible example of digital innovation in the field of Industry 4.0.

The fully automated tyre factory of Goodyear in Dudelange is yet another example of such milestones pointing the way to a fully digitalised industry and economy.

Are there any transnational dimensions to the strategy or cross-border projects?

Many projects described in the strategy are to be considered in the European context, and have, as such, cross-border and supranational aspects. Our HPC, for example, is part of the European network of supercomputing and will benefit from European co-funding. Our progressive approach in the fields of HPC and big data – the new building blocks of digital competitiveness – has resulted in Luxembourg being chosen as the location of the EuroHPC agency that manages the EU’s supercomputing initiative.

The L-DIH is also part of a European network aimed at bringing together supply and demand in the context of the digitalisation of industry, and, in particular, SMEs. It will work together with Digital Innovation Hubs all over the EU to provide access to technological expertise and experimentation facilities.

I would also like to mention the cross-border testbed for automated and connected driving set up in partnership with our neighbouring countries. This data-driven project makes it possible to test autonomous driving and smart mobility solutions in a cross-border area connecting France, Germany and Luxembourg. The aim is to attract pilot projects and research activities centred on data in the smart mobility sector.

What are Luxembourg's main advantages as a location for international companies involved in data-driven innovation?

Luxembourg's openness has always been a key success factor for the economy. The positive development of our manufacturing industry and our major financial centre has been fuelled by attracting international entrepreneurs, investors and activities.

I'm convinced that the same is true for the ICT sector. Well-established companies as well as start-ups from all over the world come to Luxembourg to develop their activities and serve

not only the national markets, but customers from all over Europe and beyond.

As mentioned before, the government recognised at an early stage that the future lies in the digitalisation of our economy and society. This is why we equipped ourselves with the necessary infrastructure to master the digital future. Our ICT infrastructure, capacities and competences are outstanding, and we have steadily maintained a high level of investment in the field. Data centres, connectivity, cybersecurity and related skills are at the heart of our strategy to be a trusted hub for valuable data.

With the high-end digital infrastructure, we have prepared the national economy well for the challenges we will face in a digital interconnected future. Luxembourg also has a modern and reactive legal and regulatory framework designed to foster business development. We can thus offer a unique and secure environment for high-potential digital activities where innovative ideas can be transformed into successful business. ➤



The 2017 ground breaking ceremony for the new production facilities of Goodyear Tire & Rubber Company in Luxembourg. The new operation is fully governed by the principles of Industry 4.0.

How can Luxembourg attract, train and retain talents with the skills needed for the data economy?

Luxembourg owes a large amount of its economic success to its foreign labour force, consisting of both expats and cross-border commuters. Diversity is an important driver of innovation, and Luxembourg is an expert in embracing all its facets. The country is a welcoming place where it is easy to settle and find work, and where administrative procedures run smoothly with support from responsive multilingual government officials.

This makes me very optimistic about the talent and skills that we are able to build. However, attracting talents from abroad will not be sufficient, and we also need to focus on developing and retaining native skilled professionals. With dedicated educational programmes, we can foster the interest of children in science and technology, and an extended offer of higher education degrees such as the Interdisciplinary Space Master at the University of Luxembourg will ensure the availability of skilled staff in the future.

Lifelong learning also plays a key role. Our aim is to build a diverse, resilient and flexible talent pool and to facilitate the successful deployment of knowledge and skills.

Looking ten years or so into the future, what results would you like to see in order to consider the strategy as a success?

The overall goal of the data-driven innovation strategy is to propose a vision and path forward for Luxembourg. We aim to put in place the digital innovation policies and assets needed to foster the emergence of a robust data economy and a start-up ecosystem centred on data-driven innovation. This will also accelerate the digital transformation of existing industry across key strategic economic sectors.

Luxembourg will strive to become the most trusted data economy within the European Union by 2023. I'm convinced that in ten years, Luxembourg will be at the forefront of data-driven innovation propelled by start-ups that collaborate closely with corporate open innovation hubs or deploy testbed activities. **X**

Inter-ministerial collaboration

A TRANSVERSAL STRATEGY

ICT and the data economy are transversal topics with a broad impact on the economy and society in general. The strategy for data-driven innovation, developed by the Ministry of the Economy, is aimed at fostering the development and use of digital technologies by companies – large groups, SMEs and start-ups – in order to drive future growth. These technologies include artificial intelligence, the Internet of Things, smart components, systems and networks, HPC and

big data analytics, to name but a few. Their implementation will influence a broad range of aspects that go beyond the remit of the Ministry of the Economy.

“The data-driven innovation strategy includes measures that concern the whole government and will be implemented in coordination with all ministries concerned,” explains Minister Schneider. “For matters regarding energy efficiency, mobility and the sustainable use of resources, we work together with the ministries of Energy and Spatial Planning, Mobility and Public Works, and Environment, Climate and Sustainable Development. Within the ‘Digital Luxembourg’ initiative, we collaborate with all the stakeholders for the development of digital skills. Finally, we discuss

financial incentives and tax measures with the Ministry of Finance.”

In parallel with the government's work on data-driven innovation, the Ministry for Digitalisation developed a new artificial intelligence strategic vision for Luxembourg, focusing on society and citizens. This strategy will further support Luxembourg's ambition to be among the most advanced digital societies in the world. “We obviously work in close cooperation with the Ministry of State and the Ministry for Digitalisation as the topics they endorse are complementary to ours,” comments Minister Schneider. **X**



GOING ABOVE AND BEYOND

Flying with Luxaviation gives you the ultimate advantage: Time and comfort. Whether for business or leisure, we will provide a serene journey. By raising the standard of service excellence we ensure that every flight is truly unforgettable.

Luxaviation Group 4a, rue Albert Borschette L-1246 Luxembourg T +352 42 52 52 1 info@luxaviation.com

www.luxaviation.com

luxaviation. we fly your way.

HPC AND ARTIFICIAL INTELLIGENCE

First-rate infrastructure for the data economy

Data is the most precious asset of the digital economy. Europe is building a world-class infrastructure for high-performance computing, thereby making it possible to exploit this highly valuable resource on an unprecedented scale.

The need for massive computer power to process big data is rising exponentially in both industry and the research sector, and high-performance computing (HPC) has been on Luxembourg's agenda for the past decade. Well aware that Europe was lagging behind in this field, and that the necessary investments would exceed what a single country could do on its own, the Luxembourg government initiated discussions with the European Commission resulting in the launch of a pan-European HPC initiative.

In 2017, Luxembourg and six other countries signed an agreement to participate in the joint European and national effort to build and deploy a world-class computing and data infrastructure in Europe with participation of all EU member states and associated countries.

The EuroHPC joint undertaking was set up to pool all financial means available for developing top-of-the-range exascale supercomputers for processing big data. Recognising the leadership shown by Luxembourg during the process, the EU decided to locate the EuroHPC in the Grand Duchy.

Innovative infrastructure

In early 2019, the EuroHPC launched a call for proposals to select eight sites all over Europe that would host petascale supercomputers. Luxembourg was obviously keen to host one of the HPCs. "We wanted to propose an innovative computer architecture adapted to the needs of the Luxembourg economy and our strategy for data-driven innovation," says Jean-Marie Spaus, HPC Project Coordinator at the Ministry of the Economy.

Following discussions with the user community from the outset, the ministry brought together an innovative team that developed a modular supercomputing architecture. Luxembourg's proposal was highly rated during the evaluation process, ranking second overall. "Our innovative approach and the business case behind was highly recognised," notes Mr Spaus.

Open for business

Located in Bissen, literally next door to Luxembourg's Mobility Innovation Campus, the HPC will be available to start-ups and industrial companies as well as universities, public research organisations and administrations. "This is quite unique as most HPCs are pure research centres," says Roger Lampach, CEO of multi-tier and multi-tenant data centre facility LuxConnect that will host

the HPC. “35% of the capacity is reserved for research, and we will commercialise the remaining 65% to companies inside and outside Luxembourg.” Expecting the HPC to be operational at the end of 2020, LuxConnect is starting the recruitment of hardware, software, application and user support specialists with relevant expertise in fields such as Industry 4.0, smart mobility, health technologies and space.

Luxembourg has a solid basis for making the HPC a success. “We have the knowledge of data processing, high-speed connectivity, top-tier data centres and computing power and cloud computing elements on top,” says Mr Spaus. “Our objective is to turn Luxembourg into a kind of HQ for data owned by companies. We want to bring enormous amounts of data here, process it and create information with real economic value.” The HPC is making this possible.

Artificial intelligence laboratory

Big data processing is also the basis

for developing artificial intelligence (AI), another Luxembourg key focus area. The demand for AI-related technologies is growing, notably in the fields of finance, healthcare and space resources research, and in early 2019, Luxembourg set up the first European partnership on artificial intelligence with global AI leader NVIDIA. It was put in place in the context of the governmental initiative Digital Luxembourg that aims to strengthen Luxembourg’s status as a digital pioneer. “This partnership will give our researchers access to state-of-the-art equipment and, in particular, allow them to benefit from NVIDIA’s experience to treat real-world problems by using AI,” said Stéphane Pallage, the rector of the University of Luxembourg, at the launch of the lab.

Senior research scientist Radu State heads the research group at the university’s Interdisciplinary Centre for Security, Reliability and Trust (SnT) that hosts the laboratory. “Together with representatives of Digital Luxembourg, we started to reflect on using graphics >

Husky

PIONEERING THE FACTORY OF THE FUTURE

Website
husky.co

Husky Injection Molding Systems chose its Luxembourg production site as the location for its Industry 4.0 initiative “Factory of the Future”, a key project to bring the groups’ performance to the next level. Its aim is to make the entire end-to-end business process, from the request for an offer to the delivery of the final product, completely digital. Using one of its products as a model, the company has developed a successful proof of concept in collaboration with Siemens and the University of Luxembourg.

“There were two main reasons for launching this project in Luxembourg: firstly, because we had people with the right skills to design, lead and implement such a pioneering activity here, and secondly, because we received considerable support from the Ministry of the Economy to help speed up the process,” explains Director of Digitisation Jean-Christophe Witz.

The next step will be to implement the new process for all products. “We are benefiting from Luxembourg’s Skills Bridge programme to train our staff for working in a fully digitalised environment,” says Mr Witz. The Industry 4.0 processes developed in Luxembourg will also be deployed across Husky’s different sites around the world. X

FACTS

10

Luxembourg’s high-performance computer will have a capacity of 10 petaflops (or 10,000,000,000,000,000 computing operations per second).

23%

23% of Luxembourg companies are currently using artificial intelligence [source: PwC Luxembourg, 2019].

DATA ESSENTIAL

TURNING DATA INTO BUSINESS VALUE

Website
data-essential.com

Data Essential provides the tools needed for companies to be able to extract value from their data. The start-up specialises in data analytics and platforms on one hand, and in cloud native infrastructure on the other. "We enable our customers to create business value from their data through machine learning, deep learning or other aspects of artificial intelligence," explains founder and CTO Jonathan Basse. "We help them build platforms and capabilities needed to tackle new types of projects and focus their own software development on creating business value rather than on solving technical challenges."

Data Essential has clients in sectors ranging from manufacturing to aerospace and administration, both in Luxembourg and abroad. "Luxembourg obviously offers a lot of opportunities in the financial and insurance field, but we have no vertical specialisation and no business knowledge as such," says Mr Basse. "We put in place appropriate workflows for data acquisition and transformation as well as data processing platforms. These enable our customers to innovate and launch new business activities."

The company was recently acquired by the French group Linkbynet. A move that will allow it to extend its international reach. **X**

processing units (GPUs) produced by NVIDIA for AI and machine learning," he remembers. Digital Luxembourg organised an initial workshop with NVIDIA that was met with much interest and led to the idea of a large-scale collaboration.

Focus on key sectors

NVIDIA, the university's HPC centre, the SnT, the Luxembourg Centre for Systems Biomedicine (LCSB) and the Luxembourg Institute of Science and Technology (LIST) have initially committed to designate a team of six people to work on joint projects. The SnT hosts an engineer from NVIDIA who plays a coordinating role. "One of the first things I think we can do together is engage in machine learning and deep learning projects funded by the EU's Horizon 2020 programme for research and innovation," says Dr State. "I also really look forward to extending the collaboration to private companies."

Working with the private sector is a priority for the SnT, and almost all of the 34 researchers in Dr State's

group are funded by industry projects. "We work in a very applied way with local businesses," he explains. "The NVIDIA technology is very interesting for Luxembourg's key sectors such as autonomous driving or space technologies. There is, for example, a company here in Luxembourg that is building a rover for exploring the surface of the moon. NVIDIA's GPUs have the very high image processing capacity needed to determine where to land and to operate the robot on the moon."

The university now offers training sessions, open to anyone, which give participants hands-on experience of working with NVIDIA technology. So what results does Dr State hope to see coming out of this AI collaboration? "I'm very business oriented. For me, the initiative is successful if in the next 5-10 years we manage to develop 20-30 companies specialised in machine learning that can show positive economic results." **X**

"Our objective is to turn Luxembourg into a kind of HQ for data owned by companies. We want to bring enormous amounts of data here, process it and create information with real economic value."

Jean-Marie Spaus, HPC Project Coordinator,
Ministry of the Economy

THEMIS

LEX

*“Lead your project
to success”*



- Finance
- ICT / Intellectual property
- TAX

- Corporate & Restructuring
- Private Equity
- Investment Funds

THEMIS LEX - Law firm

15, rue du Fort Bourbon L-1249 Luxembourg Tel. : +352261202-1



CYBERSECURITY

A secure hub for data

An important legacy from the country's history as a leading financial centre, cybersecurity is a cornerstone of Luxembourg's data-driven economy. As the digital sector expands, so does the market for cybersecurity solutions.

As a major banking centre, Luxembourg has spent decades building up expertise in protecting confidential information and creating a climate of trust. Cybersecurity has been high on the government agenda for the past 20 years. The intention is not only to help companies and citizens protect themselves against increasingly sophisticated cyber-crime, but also to strengthen the public's confidence in the country's digital environment and turn cybersecurity skills and infrastructure into a real economic asset.

"Multiple players with complementary skills form a mature ecosystem for cybersecurity," says François Thill, Director of e-Commerce and Information Security at the Ministry of the Economy. The players include around 150 companies as well as specialised government bodies. The Interdisciplinary Centre for Security, Reliability and Trust (SnT) of the University of Luxembourg and other public research centres carry out high-level research in the field.

At the international level, Luxembourg is widely recognised as a centre of excellence in cybersecurity and a trusted data hub. Estonia opened the world's first digital embassy here in 2018 to store valuable, sensitive government information, and Monaco is in the process of opening the second one. Luxembourg also stands out for its involvement in a series of European pilot projects launched in early 2019 to strengthen cybersecurity research and coordination across the EU. It is the only country to participate in three out of the four projects.

A culture of sharing
Providing companies with hands-

on tools that help them increase their level of cybersecurity is a government priority. “Software developed by Luxembourg’s public sector CERTs – Computer Emergency Response Teams – is made available to the national and international community via open source,” says Mr Thill. “We are also actively sharing information about cyber threats.”

A high number of Luxembourg organisations are connected to the malware information-sharing platform MISP, where 1,000 companies worldwide provide input about threats and attacks. “This is a complete game changer as participating companies are not limited

to relying on their own logs to see what is going on, but get an overview of the occurrence and nature of wider malware threats and campaigns. Authorities can also use MISP to identify cybersecurity tendencies and launch awareness-raising activities to improve companies’ resilience to threats.” Mr Thill is also keen to promote the democratisation of cyber risk management. “Identifying risks and developing strategies to reduce them is extremely important for any company with a digital dimension, and it also represents a big challenge,” he points out. “Most companies, in particular SMEs without specific expertise in the field, have difficulties estimating the

risks and their consequences. We support them by bringing together national experts able to come up with a structured risk evaluation as well as a probability and impact assessment of main threats. This information can then be shared within the business community.”

Cyber insurance: a new market

With the increasing awareness around cyber risks, the demand for solutions is growing. “The cybersecurity market in Luxembourg is well established and offers a lot of business opportunities and potential partners,” says Pascal Steichen, CEO of Securitymadein.lu, a public entity helping private

Top left:
François Thill
Bottom right:
Pascal Steichen

FACTS

31%

The percentage of organisations that have experienced cyber attacks on operational technology infrastructure. [Source: Cisco]

+600%

The increase of Internet of Things attacks in 2017. [Source: Symantec]

companies manage the cybersecurity aspects of their digital transformation.

A new market niche under development is cyber insurance. In addition to insuring organisations against the effects of cybercrime, it also has a positive effect on the general level of cybersecurity. “Companies will obtain an insurance if they fulfil certain security criteria. This means that insurance companies will be able to play the role of an informal regulator of cybersecurity issues, in particular in the SME community. SMEs may count on the emergency support teams of their insurer,” Mr Thill explains.

The Ministry of the Economy has been actively involved in shaping insurance companies’ interest in the cybersecurity market, and a first Luxembourg insurance firm is launching a dedicated policy for SMEs this year. “This new niche also means that insurance companies are becoming interested in investing in cybersecurity firms. They need to connect themselves with experts who can help their clients avoid disasters,” Mr Thill adds.

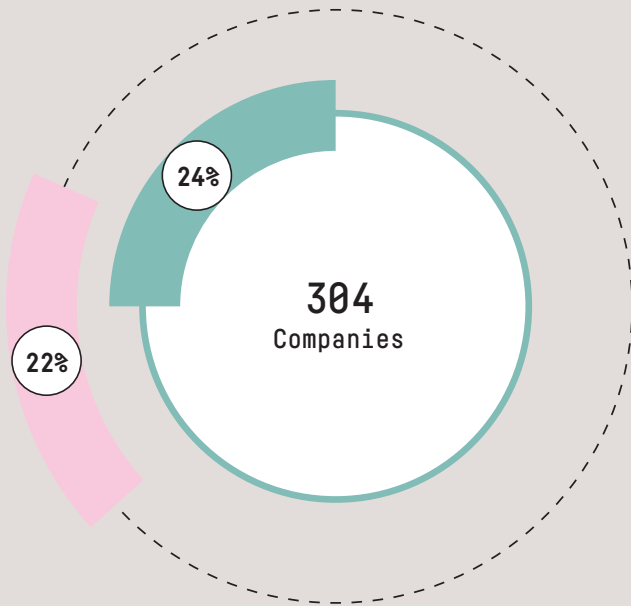
Managing digital identities

Luxembourg was the first to develop a highly reliable system for digital identification, and is also one of the first countries to implement the European regulation on electronic identification and trust services for electronic transactions on the EU’s internal market (eIDAS). The adoption of this regulation makes it possible for citizens from other EU countries offering eIDAS compatible digital identifications to conduct secured internet transactions in Luxembourg with their national ID. An important step for a country

LUXEMBOURG CYBERSECURITY ECOSYSTEM

74 companies

with cybersecurity as
a core business



68 start-ups

represent more than 20% of
the national cybersecurity ecosystem

with a high number of cross-border commuters.

A new and extremely important field in the data economy, however, is the removal of identifiable information from personal data. “Much of the most precious data for innovation is related to human activities,” Mr Thill points out. However, the storing and use of personal data is subject to very strict rules specified in the EU’s General Data Protection Regulation (GDPR). “Privacy is a basic human right, and I don’t see the GDPR as

a hindrance but as a guide for doing things properly and gaining the trust of your customers.”

Companies that have collected valuable data related to their clients can only share it with others if it has been properly anonymised. “There are of course technical solutions for doing this, but the challenge is to make the anonymisation sustainable over time,” says Mr Thill. “When combined with other data series, including new attributes, re-identification of individuals may become possible.”

DIVERSIFIED SOLUTIONS

Luxembourg companies mainly specialised in risk identification and systems protection



TOP 7 SOLUTIONS

Cover 60% of the national market



1. Governance, risk & compliance



2. Identity & access management



3. Data security



4. Asset management



5. Penetration testing



6. Backup & storage



7. Awareness & training

Source: Mapping by Luxinnovation and Securitymadein.lu

Determined to create an excellent environment for companies to work with data in a trustworthy manner, Luxembourg is now focusing on the development of a certified service for the pseudonymisation and anonymisation of data that is fully compatible with GDPR. The ambition is to gain the official approval of the National Commission for Data Protection and of the European Data Protection Board.

Secure data lakes

Luxembourg's intention is to couple

the high-performance computer (HPC) under development with major data lakes containing valuable raw data. The country is already home to one of the world's largest data lakes for space data analytics. With support from the Luxembourg Space Agency, leading space-to-cloud analytics company Spire Global has launched an open source data lake that is accessible free of charge to all start-ups, research institutes and public agencies in Luxembourg.

In order to provide an attractive environment where companies can link their own data with accessible data lakes in full GDPR compliance and process it through the HPC, the next step is to create a kind of virtual, secure and controlled laboratory for handling data. "This would allow companies to provide access to their anonymised data for a fee without risk of violating the rights of their clients due to very low and controlled risk of re-identification. We would be able to analyse in advance what data series are to be linked, determine the potential impact on privacy and make sure that there is no exfiltration of data that might be harmful for people or the companies making it available," says Mr Thill.

Potential for start-ups

There is ample room for new entrants in Luxembourg's expanding cybersecurity ecosystem. "We are still looking for everything related to the data economy, i.e. companies in the fields of cybersecurity linked to big data lakes, high-capacity communication and so on," says Mr Thill. "There is also a lot of potential for security operation centres, threat hunting and intrusion protection systems."

This expertise can be enhanced by international companies or start-ups. "Our market is mainly service oriented, so start-ups developing new products are welcome," says Mr Steichen. "There is also a high demand for experts in areas such as artificial intelligence, fintech and HPC." As in many other countries, the need for specialised human resources exceeds the supply. "Fortunately, our country has many attributes to attract great talent," concludes Mr Thill. **X**

3 QUESTIONS FOR

Marina Guérin-Jabbour
Head of Digital Innovation Hub,
Luxinnovation

Why was the Luxembourg Digital Innovation Hub, or L-DIH, set up?

The omnipresence of digital technologies and data is completely transforming the way we do business, and the government is determined to position Luxembourg as a leading digital economy. The L-DIH is one of the tools that will turn this strategic ambition into reality.

Our role is to provide companies with personalised services in order to help them succeed with their digital transformation and enhance their competitiveness. We will match them with IT service providers with the most relevant expertise. In addition, we will provide access to technology platforms, prototyping solutions and financial advice, as well as training and skills development.

What is the key added value of the L-DIH?

Our main task is to identify and match companies with external resources, but our role goes far beyond that. Firstly, we help our clients determine what form their digital transformation will take and what processes and technologies they need. We also assess their digital maturity and analyse how it can progress further. As digitalisation radically changes the competitive landscape of many sectors, we then identify new competitors of which they need to be aware. Finally, we help them develop strategic plans for how to succeed in this rapidly evolving environment.

In addition, the L-DIH offers solution providers excellent opportunities to present their offering to industrial partners and potential clients, in Luxembourg or abroad. As the hub is part of the Digital Europe programme, we also serve as a relay to European institutions.

What results do you want to see in order to consider the L-DIH as a success?

We will be successful if we are involved in the major digital transformation projects of customers from the early stages to the implementation. Another key indicator is whether companies come back to us after our initial meeting to ask for further support with the next steps. We also hope to provide companies and solution providers with opportunities to expand their activity across our national borders.

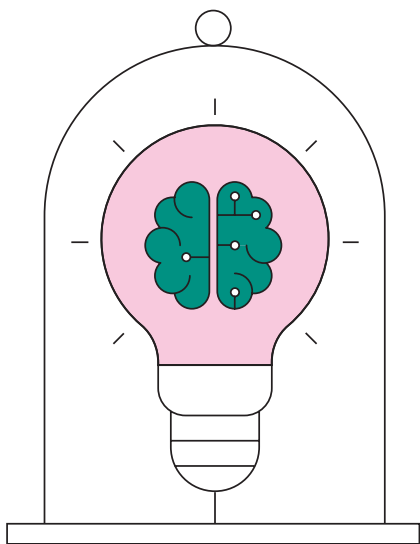
Industry 4.0 is a major priority in Luxembourg. The ultimate goal of the L-DIH is to participate in boosting the national economy in this field and to influence the digitalisation of other sectors. **X**

“Our role is to help companies succeed with their digital transformation.”

About L-DIH

Managed by Luxinnovation, the L-DIH helps companies find the right experts, advisors and IT solution providers to define and succeed with their digital transformation. The Ministry of the Economy, employers' association FEDIL – The Voice of Luxembourg's Industry and Luxinnovation are its core partners, and collaborate with the University of Luxembourg, the Chamber of Commerce and the Luxembourg National Research Fund.

Photograph by Patricia Pitsch [Maison Moderne]



INTELLECTUAL PROPERTY

Strategies for the digital era

Favourable framework conditions for the successful use and protection of intellectual property are crucial in the data economy.

Intellectual property (IP) is a key consideration in the growing digital economy. “IP-intensive industries contribute over 45% to Luxembourg’s GDP, and the fastest growth rate of IP filing can be seen in digital enabling technologies such as 3D manufacturing and artificial intelligence,” says Lex Kaufhold, who heads Luxembourg’s Intellectual Property Office.

Digital technologies are indeed a game changer for traditional industries. Take smart, autonomous cars as an example. Automotive manufacturers specialised in building efficient vehicles will need advanced software, communication technologies and so on to make their cars self-driving. This is not necessarily their main field of expertise, and they might have to

set up partnerships or licencing agreements with digital companies that own the IP for these technologies.

A strategic asset

Understanding how to develop large, strategic IP portfolios is therefore essential. “Take IP aspects into account from the very beginning of every development process – when you reach the end it might be too late,” Mr Kaufhold advises. “Keep your findings secret until you have spoken with competent experts and decided if, and how, your IP should be protected.”

However, protecting digital IP can be challenging. “One much-discussed question is how far it is possible to patent software,” says Mr Kaufhold. “And to whom does the copyright of an invention

made by artificial intelligence belong? For the time being, no one has the answer to such questions.”

Showing the way

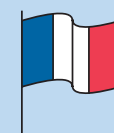
The Intellectual Property Office is in charge of the framework and instruments offered in Luxembourg to help companies protect their IP. The office also helps companies find answers to complex questions. “We don’t have specialists for everything, but we know where to find them,” Mr Kaufhold points out. “Our involvement in international IP organisations also enables us to point you to experts that can at least help with finding the beginning of an answer.” **X**

Mobility: smart, autonomous, connected

Digest:

A renowned centre for international automotive companies, Luxembourg is focusing on the huge opportunities for developing new mobility solutions brought by digitalisation. The country is home to an increasing number of innovative mobility start-ups, and attracts international innovators such as Silicon Valley-based 3D-mapping and localisation specialist Civil Maps that is opening its European headquarters here. In order to facilitate the development of automated and connected driving, Luxembourg has, together with France and Germany, created a cross-border digital testbed open to all companies and researchers

working on automated driving and related services. The University of Luxembourg's Interdisciplinary Centre for Security, Reliability and Trust (SnT) is the first Luxembourg user, and benefits from the testbed to trial cross-border automotive shuttles in collaboration with French and German partners. New mobility services can also be tested on the emerging Mobility Innovation Campus, a 14 hectare campus welcoming both start-ups and well-established automotive companies that want to be part of a community characterised by collaboration, synergies and open innovation. X



France

High-speed zones,
tunnels, tolls

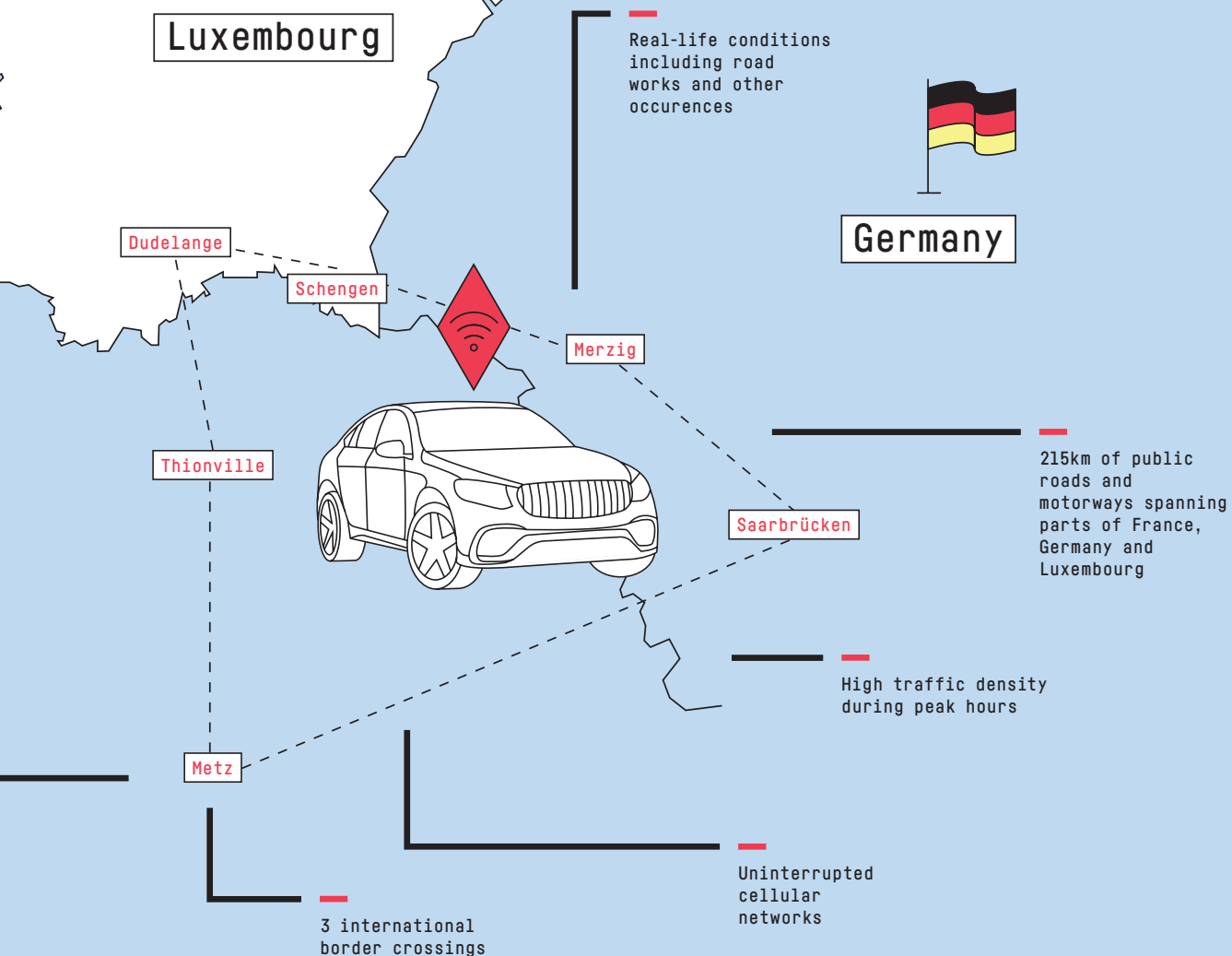
Texts by Lena Mårtensson >

Photograph & Illustrations by Maison Moderne

+500

Luxembourg is part of Europe's largest international automotive network covering the Grand Duchy as well as neighbouring regions in Belgium, France and Germany. It consists of over 500 automotive companies, including seven OEM manufacturing plants, which together create more than 150,000 highly qualified jobs.

CROSS-BORDER DIGITAL TESTBED FOR AUTONOMOUS AND CONNECTED DRIVING AT A GLANCE



PILOT PROJECTS

Enabling the wide-scale transformation of mobility

Several unique test sites in Luxembourg are open to companies that develop next-generation mobility solutions for the European market.

The impact of digitalisation on mobility is monumental. Smart, connected vehicles are becoming a reality, self-driving cars are under development and new concepts such as car sharing are already in place. New players are entering the market alongside the established automotive industry, bringing with them experience from other sectors such as communications, payment methods and data management and processing.

This evolution is also reflected in Luxembourg. Known for decades as an automotive centre with companies like Goodyear, IEE, Carlex, Delphi and CEBI International, the country today also hosts an increasing number of innovative mobility start-ups. “New companies includ-

ing, for example, car-sharing provider ExaMotive, electric scooter producer Ujet and e-payment specialist Mercedes Pay, are selling across the European market, and we are attracting international start-ups such as Civil Maps,” says Jean Schiltz, Deputy Director of Smart Mobility at the Ministry of the Economy. “Our own needs to develop and deploy new mobility solutions is a strong driver. Luxembourg is an attractive test lab as we are ready to put new initiatives into practice in order to solve our daily mobility problems.”

Automated driving across borders

Automated and connected driving might become a useful alternative for mobility in the future, but making it function in different

countries is a challenge. Automated vehicles need to be able to manage local differences such as road markings and traffic signs. They are also dependent on uninterrupted connectivity, which is complicated to achieve when driving across or along national borders with frequent changes between mobile networks.

To help overcome these challenges, Luxembourg, France and Germany have created a cross-border digital testbed for automated and connected driving. “The testbed is an innovation platform open to all companies and researchers working on automated driving and related services,” says Christian Tock, Director of Sustainable Technologies at the Ministry of the Economy. “It has generated a lot of interest from international players



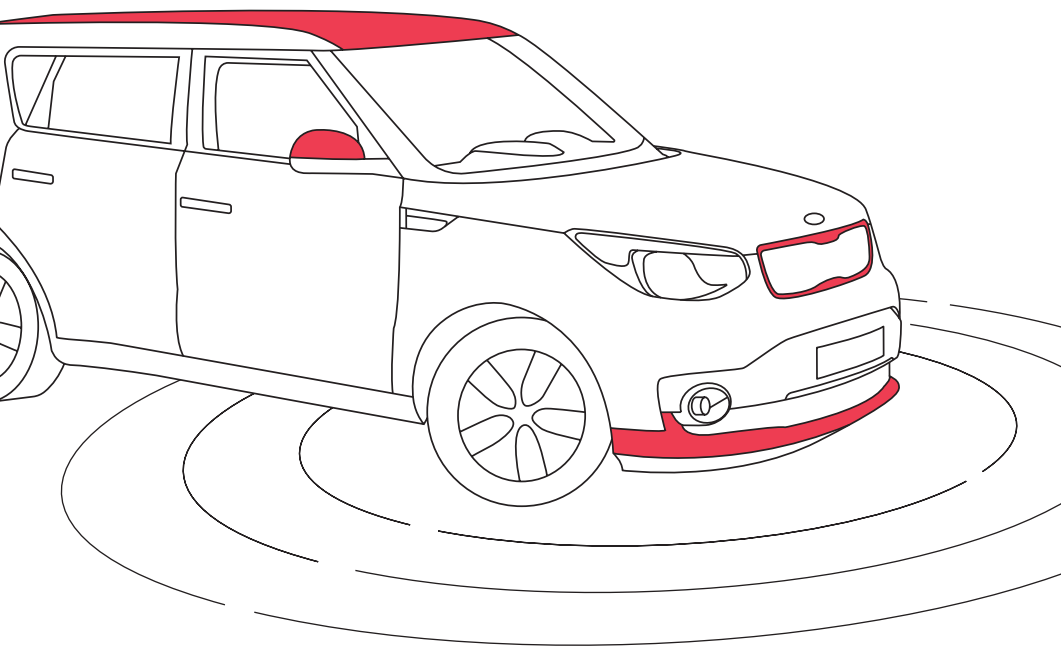
developing mobility solutions for the European market.”

The testbed consists of over 200 km of motorways and public roads, soon to be covered by 5G connectivity. “Due to legislative restrictions and liability risks in Europe, most of the development work with self-driving vehicles is done at closed R&D facilities, but their next step is to be out there on the roads,” says Joost Ortjens, Head of International Business Development – Automotive at Luxinnovat. “When this takes place, the testbed will be extremely useful.” In order to facilitate the use of the testbed, the government is working with its French and German

counterparts to set up mutually recognisable testing authorisations that will be valid in the whole testbed region.

A campus for open innovation

Another hotspot for the sector, the Mobility Innovation Campus, is taking shape in Bissen, located 20 minutes north of Luxembourg City. Extending over 14 hectares, the campus will host start-ups as well as well-established automotive companies. Sensor technologies specialist IEE has already relocated its activity there, and Goodyear will soon follow suit with some 130 staff members focusing on the development of advanced mobility technologies. ➤



SELF-DRIVING

Scientists from the University of Luxembourg have turned a Kia Soul into a self-driving vehicle.

SnT

MOBILITY RESEARCH FOR INDUSTRY

Website

uni.lu/snt

The University of Luxembourg's Interdisciplinary Centre for Security, Reliability and Trust (SnT) is the first Luxembourg organisation to conduct tests on the cross-border digital testbed.

“The cross-border scenario allows us to test the autonomous capabilities of vehicles we have developed on public roads in three different countries with variations in traffic signs, connectivity and so on,” says Raphaël Frank, research scientist at the SnT. “We collaborate with French and German partners in a European project aimed at testing cross-border automotive shuttles.”

The SnT is strongly orientated towards industrial projects. Having collaborated with traditional automotive players such as Delphi and IEE for several years, the centre is increasingly being approached by companies from the IT sector that develop mobility applications. “We also work with insurance company Foyer Assurances on how they can adapt their insurance products once we have semi-automated and automated vehicles on the roads,” confirms Dr Frank. “There is a huge future market for self-driving cars and related services, and we are interested in doing relevant research with industrial partners from Luxembourg and abroad.” X

“We want to create a location where companies are able to collaborate, leverage synergies and build a true community on a lively site characterised by open innovation,” comments François Knaff, Director for Industry at the Ministry of the Economy. “We hope that start-ups will partner with more mature companies and provide new technologies and know-how. We also aim to develop partnerships with universities and research centres to bring students and professors to the site.”

A large collective building with incubator facilities as well as shared meeting rooms, a canteen and an events centre will be built in the next few years. Temporary offices for start-ups that want to move in immediately are already available. The campus itself will also be used for showcasing new technologies. “POST Luxembourg has selected the campus as one of five priority locations for installing 5G, so companies can develop applications and projects using 5G connectivity directly on site,” says Mr Knaff. “The University of Luxembourg has already started to conduct autonomous driving tests here.”

Processing big data

The collection, storing and processing of large amounts of data is central to smart mobility and autonomous driving. With its top-level data centres and high-speed connectivity, Luxembourg is particularly well placed in this area. “Companies will shortly be able to use our high-performance computer to analyse data,” Dr Tock points out.

Luxembourg is also one of five EU member states participating in the “Data for Road Safety” proof of concept project recently launched by the EU Data Task Force to improve road safety by sharing data generated by vehicles and infrastructure between countries and manufacturers. Luxembourg will manage, process and aggregate big data from Germany to be used for issuing safety-relevant traffic information to road users. “The collaboration builds on Luxembourg’s strengths in high-quality data transmission, hosting and valorisation services,” Mr Schiltz underlines.

Central but independent

Luxembourg’s geographical position offers another advantage for mobility solution developers. “It is a neutral location situated in-between two major automotive markets, namely France and Germany,” says Dr Tock. “We also work a lot with large automotive manufacturers in Europe, but we take a neutral stand in our relations with them.”

“Luxembourg is particularly interesting for companies that want to be close to leading German automotive industry players,” Mr Ortjens continues. “Luxembourg is close enough to really understand the needs of the market, but still with enough distance for start-ups to retain their independent, innovative mindset.” X

Civil Maps

“A TRUE START-UP SPIRIT”

Website
civilmaps.com

Silicon Valley-based start-up Civil Maps has developed a high-definition, 3D mapping and localisation solution enabling autonomous vehicle routing. “Our lightweight Fingerprint Base Map technology localises vehicles with exceptional accuracy in a way that is efficient and cheap, while only requiring limited capacity for data storage and processing,” explains CEO Stefan Safko.

The company is currently setting up its European headquarters in Luxembourg. “European players are not only catching up with North American competitors in the field of autonomous driving, but actually starting to spearhead. This has triggered us to take a very close look at the European market. We have mapped several cities in Europe for large companies that are using our technology for their fleets of autonomous vehicles. We look forward to start mapping Luxembourg and the area covered by the cross-border testbed in the coming months.”

Many factors brought Civil Maps to Luxembourg. The country’s proactive approach to bringing talent into the mobility sector, as well as support available to help a new company quickly solve practical issues such as office space, bank accounts and VAT number are all important factors. “There is a true start-up spirit here that enables young companies to iterate very quickly and flourish.” X

THE INTELLIGENT SOCIETY



Connecting People, Things and Business
to create tomorrow's Society.

START-UPS...

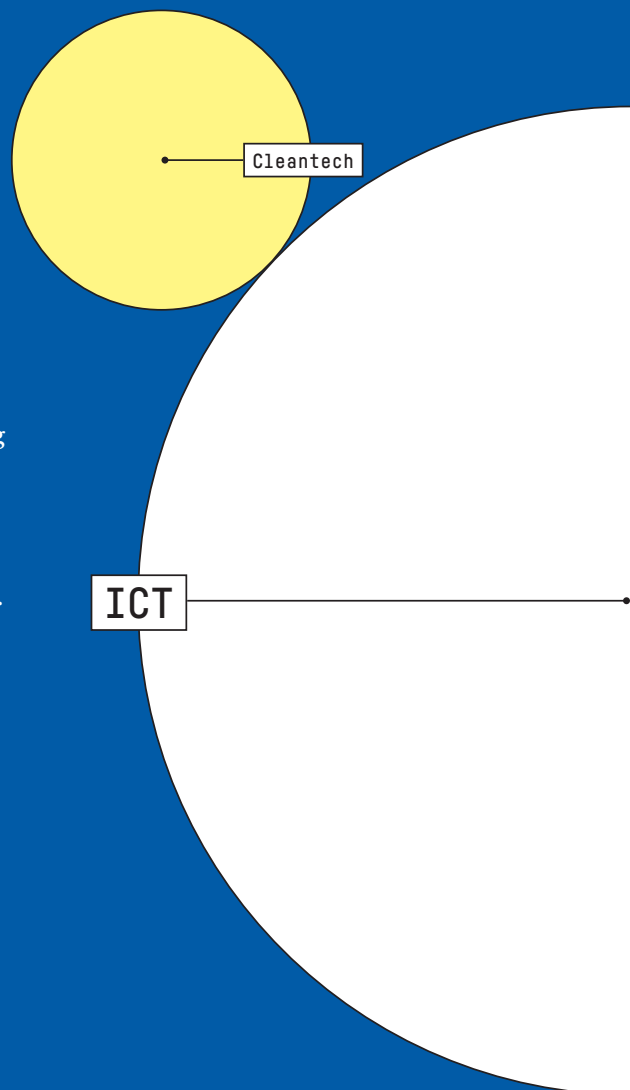
THE MAJORITY OF THE LUXEMBOURG START-UPS ARE ACTIVE IN THESE KEY ECONOMIC SECTORS.

Digest:

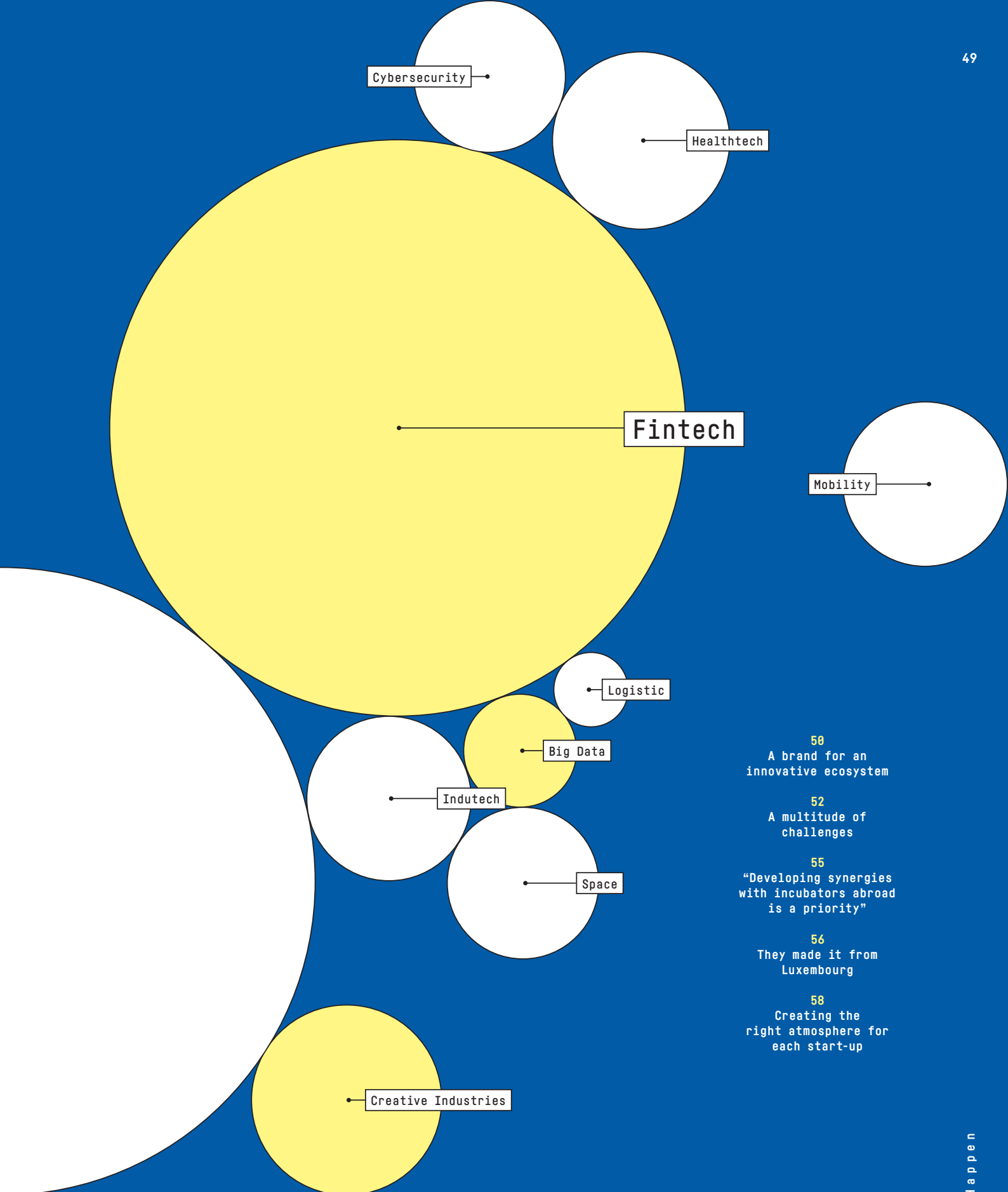
Luxembourg's economic history has given the country ample abilities to adapt to challenges and changing economic framework conditions. In other words, its way of thinking is similar to that of a start-up. This is probably its main strength when it comes to attracting young, innovative companies.

Over the past few years, a performing start-up ecosystem has patiently been built up. It is now mature and one of the cornerstones of the country's ambition to implement a data-driven and sustainable economy. The Fit 4 Start acceleration programme is one of the key elements. Organised twice a year

and open to both international and Luxembourg start-ups, it offers specialised coaching to help entrepreneurs identify their strategic development needs and growth potential. The vision driving the initiative is to provide solid support to start-ups in their growth and international expansion by pooling together all the capabilities of the players in the local ecosystem. Luxembourg is thus positioning itself as a hub for European expansion, and the country can already show some very impressive success stories. The following pages are an introduction to what Luxembourg can offer for start-ups. ✕



Texts by Jonas Mercier >
Illustrations by Maison Moderne



50

A brand for an
innovative ecosystem

52

A multitude of
challenges

55

“Developing synergies
with incubators abroad
is a priority”

56

They made it from
Luxembourg

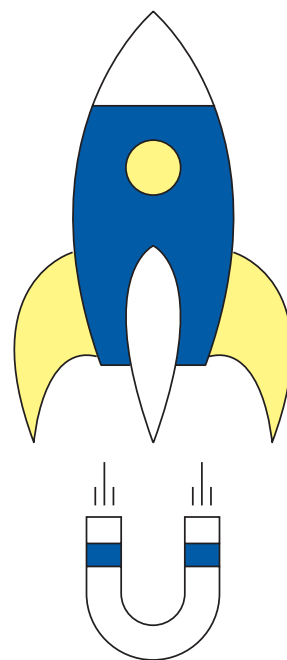
58

Creating the
right atmosphere for
each start-up

STARTUP LUXEMBOURG

A brand for an innovative ecosystem

To cement its position as an attractive location for start-ups, Luxembourg relies on easy access to support, major international players and public authorities and administrations. At the same time, the country is a clear gateway to the European market.



In today's data-driven digital world, success depends on the ability to adapt. Over the last decades, Luxembourg has been continually opening up to new ideas, innovating and reinventing its economy by constantly adapting to economic framework changes and challenges. The economy has been growing steadily, continuously outperforming the EU average.

A digital nation driving growth

After developing a powerful steel industry at the end of the 19th century, the global crisis that affected this sector in the 1970s induced Luxembourg to become a major financial centre. More than 20 years ago, Luxembourg earmarked the importance of information and communication technologies (ICT) for the success-

ful diversification of its economy. Major infrastructure investments have resulted in extensive broadband networks, ensuring international connectivity, and state-of-the-art high-end data centres. Today, new technologies and innovation are still driving the country's economy and the digital agenda is a priority for the government. "We have always been able to think in a similar way to start-ups," notes Michele Gallo, Director of ICT Coordination at the Ministry of the Economy. "Developing Luxembourg's data-driven, trusted and sustainable economy is a challenge we are ready to take on."

Initially developed to support Luxembourg's flourishing financial, broadcasting and space sectors, the rapidly growing ICT industry has enabled other key business sectors to thrive. This includes life sciences, automotive, clean technologies,

fintech and logistics, all highly connected to and dependent on ongoing best-in-class ICT developments. One of the latest initiatives is the investment in a business-oriented high-performance computer (see page 32).

Connecting international business with Europe and the world

Numerous multinational companies have established their worldwide or European headquarters in Luxembourg alongside well-known local companies. The development of the start-up ecosystem was a natural next step from which the country focused on its main asset, a dynamic and international business-oriented environment. Multilingual, multi-cultural and diversified, Luxembourg can be leveraged by start-ups as an ideal test market to develop concepts and test new products and services.

“Luxembourg offers numerous support mechanisms for start-ups, and we are able to provide personalised support to each start-up,” confirms Stefan Berend, Head of Start-up Acceleration at Luxinnovation. “This is a competitive edge, which differentiates us from other larger start-up hubs – and you can feel this spirit, as soon as you come here. The ecosystem’s many established international companies, eager to partner with innovative start-ups, are close at hand too.” Contacts are direct and facilitated by several initiatives, such as the Luxembourg Open Innovation Club (Loic), which organises meetings on specific topics between corporates and start-ups.

Solidly rooted, naturally innovative

Luxembourg’s reliability and dynamism go hand in hand with its spirit of openness. People from more than 175 nationalities live here – one of the greatest resources of the open and outward-looking country – and around 70% of the workforce is made up of foreigners.

Openness is also a key component of the country’s economic development. Nestled in the heart of Europe between Belgium, France and

Germany, Luxembourg has always valued international cooperation. Entrepreneurs who have chosen the Grand Duchy to grow their start-ups know this better than anyone else. The Chinese fintech PingPong decided 2 years ago to settle in Luxembourg in order to enter the European market. “Here in the financial hub of Europe, we received great support from the local regulators, banking partners and access to the vast talent pool available to support our growth,” says Aaron Shuai Lu, co-founder of this e-commerce start-up.

The country’s well-known commercial and political neutrality also helps to facilitate good international business relationships. “Being based in Luxembourg gives us more commercial neutrality than if we were located in one main market and makes it easier to break into another one as a foreign company,” says Mauro Mariani, the founder of Oply, a start-up that provides urban mobility solutions. Created in 2016, the company currently operates nearly 450 vehicles in the cities of Munich and Berlin.

Startup Luxembourg gaining visibility

Since the creation of the country’s first incubator Technoport in 1998,

the start-up landscape has been enriched with numerous public and private initiatives. In addition to hosting facilities, Luxembourg also offers a wide range of support services for young entrepreneurs, including those provided by Luxinnovation, the House of Startups and the Luxembourg House of Financial Technology (Lhoft), the main driver of innovation for financial technologies.

Many private players have joined the ecosystem over the years. Today, Luxembourg has about fifteen incubators and accelerators, funding support for each stage of maturity and dozens of dedicated start-up events. “We have always worked to build a complete ecosystem able to meet all the needs of innovative start-ups,” says Jean-Michel Ludwig, Director of Business Development at Luxinnovation.

The joint efforts of the Ministry of the Economy and private organisations have led to a strong and continuous growth of the start-up ecosystem. The next step is to increase the international visibility and recognition of the ecosystem through all digital channels and build an identity of its own. This is why the initiative “Startup Luxembourg” was launched by the Ministry of the Economy and Luxinnovation, with the dedicated website startupluxembourg.com. Startup Luxembourg is now present on Twitter (@StartupLu), Facebook (@StartupLux) and LinkedIn (Startup Luxembourg) to provide start-ups with ongoing news about the ecosystem and dedicated events. **X**

“Being based in Luxembourg gives us more commercial neutrality than if we were located in one main market.”

Mauro Mariani,
founder, Oply

ACCELERATION PROGRAMME

A multitude of challenges

Funding is often seen as the key to unlock a start-up's ability to expand but it takes more than that. Fit 4 Start, Luxembourg's acceleration programme managed by Luxinnovation, offers high-quality coaching to put start-ups with high potential on the road to success.

Photograph © Luxinnovation / Marie De Decker



The Fit 4 Start concept is simple: participants get four months of coaching, access to a collaborative workspace, a grant of up to €150,000 and the opportunity to connect to the entire Luxembourg start-up ecosystem. The acceleration programme, which started in 2015, initially focused exclusively on ICT start-ups. The success of the first editions encouraged the Luxembourg government to open it up in 2018 to the field of health technologies, and in 2019 to the space sector. More than one hundred start-ups are preselected every year to pitch to a selected jury in Luxembourg.

Entrepreneurs from all over the world apply to Fit 4 Start, with the possibility of securing an attractive equity grant being one of the main attractions. However, after starting the programme, they quickly realise that the high-level coaching is what really makes a difference. “The money is of course helpful, but what was really important was to develop our business knowledge,” says Caner Dolas, co-founder of Gamma AR who participated in the spring 2019 edition. This originally German start-up is developing an augmented reality tool for construction companies that allows visualisation of all the elements of a building using 3D models. “In our team we are all engineers, and Fit 4 Start definitely helped us improve our business skills.”

The ability to question yourself

Coaching has been the central element of the programme from the very beginning. Luxinnovation pays particular attention to the choice of coaches and jury members,

who also function as mentors. The level and complementarity of their expertise is essential. “The strength of our programme is that it combines group sessions with coaching that is personalised and adapted to each start-up,” explains Luxinnovation’s Fit 4 Start ICT coordinator Laurence Hulin.

The objective of the coaching is to help the entrepreneurs identify their strategic development needs and growth potential. During several working sessions, the start-ups are invited to reflect on all elements necessary to put together a business plan, to assess the viability of their company and to consider the time it will take them to find the necessary partners and funding. “I have been working with start-ups for almost 20 years, and I have noticed that very few entrepreneurs really know their clients,” says Michel Blumenthal, one of the coaches. “Fit 4 Start significantly helps start-ups to position themselves on the market and get a clear idea about what their clients really want,” adds Jean-Yves Herriott, an investor and entrepreneur who was part of the jury from the 8th programme edition.

The Fit 4 Start coaching is very intensive, and the participants’ openness to listen to the advice provided by the coaches and jury members, as well as their ability to question themselves, is crucial. “We were permanently being challenged,” remembers Kevin Muller, CEO of corporate password management specialist Passbolt who participated in the 4th edition of Fit 4 Start. “As an entrepreneur, you have a lot of preconceived ideas. It was very useful to discuss with ➤

FACTS

1

acceleration programme
dedicated to high
potential start-up

2

editions per year

3

verticals – ICT,
healthtech and space

up to

30

start-ups
selected per year

16

weeks of experts
coaching

€150K

grant [maximum]

www.fit4start.com

“Fit 4 Start significantly helps start-ups to position themselves on the market.”

senior investors and entrepreneurs who questioned even minor details of our strategy.”

Space on the radar

For the first time since the launch of Fit 4 Start, the 2019 autumn edition offers tailor-made support to five start-ups active in the space sector. Capitalising on its status as a European pioneer in the development of commercial activities in space, Luxembourg decided to open the acceleration programme in this sector. A particular focus is placed on the downstream sector of value-added applications and services derived from space-based data, sometimes combined with data from other airborne, in-situ or social network-based sources. Selected Fit 4 Start participants also benefit from a premium access to the Luxembourg Space Agency data centre, which contains data from the Sentinel 1 and Sentinel 2 Earth observation satellites of the European Copernicus system.

In addition, they can request access to the data lake (storage repository that holds a vast amount of raw data) of the spacetech company Spire Luxembourg. A real advantage for start-ups looking for data to develop their services.

In just a few years, Fit 4 Start has grown significantly and become renowned well beyond Luxembourg's borders. Nearly 300 start-ups from more than 50 different countries competed to be part of the 2019 autumn edition. 20 start-ups were admitted – 10 from the ICT sector, 5 active in healthtech and 5 in space. “Luxembourg's multicultural and multilingual culture is a crucial aspect that attracts start-ups wishing to expand on the European market. The very good relationship that exists between all Luxembourg players also helps them quickly find good partners and funding,” concludes Ms Hulin. **X**

Ume

“A SUPPORTIVE ENVIRONMENT”

Website

ume.solutions

Founded

February 2017

Participated

Fit 4 Start 2017 autumn edition

Laurent Denayer, CEO of ume:

“As a founder, you may feel that every single thing you are doing is risky. This includes the product you offer, the market in which you enter and the concept that you sell. The risk of failure is constantly on your mind and you want to minimise it.

For a start-up to be successful, aspects such as marketing, finance, operations, product development, pricing, market positioning and resource management also need to be consistently managed and adequately combined.

We wanted to take advantage of the years of wisdom accumulated by mentors to launch our start-up and not reinvent the wheel. We also wanted to be challenged in our entrepreneurial vision and consider alternative approaches.

Fit 4 Start provided us with a collaborative and supportive environment to help us identify the gaps in our business plan and work on reducing them. We were encouraged to proactively take on risks, manage them efficiently and have bigger ambitions.

Today, ume is self-funded and growing at a double digit rate. It covers most of its costs, has a footprint in more than 65 countries and is considered as one of the 100 most innovative regtechs in the world.” **X**



“Developing synergies
with incubators
abroad is a priority.”

3 QUESTIONS FOR

Diego De Biaso
CEO, Technoport Incubator

As the CEO of Luxembourg's oldest incubator, you have witnessed the development of the start-up ecosystem almost from scratch. Do you believe in an integrated European start-up ecosystem?

Yes, I strongly believe in it, although not many of us think that way yet. Technoport is one of 150 certified members of the European Business and Innovation Centre Network, and we can see that only a minority of our colleagues share our vision of a joint European start-up ecosystem. However, the number has been growing in recent years. I think it would be particularly useful for start-ups that have already left the starting blocks and need to scale up.

We have a small domestic market, which encourages our start-ups to aim for international expansion very quickly. Developing synergies with incubators abroad is a priority for us. We establish personal relationships with colleagues in other countries who can help when entrepreneurs ask us for support with entering new markets.

How is the Luxembourg start-up ecosystem positioning itself in Europe?

We have advantages that cannot be found in other countries. Factors such as the solid government support to entrepreneurship and innovation, the proximity of players and the many opportunities to test new technologies in real conditions already attract numerous start-ups from abroad. We clearly have the potential to be a central hub in the global European start-up ecosystem.

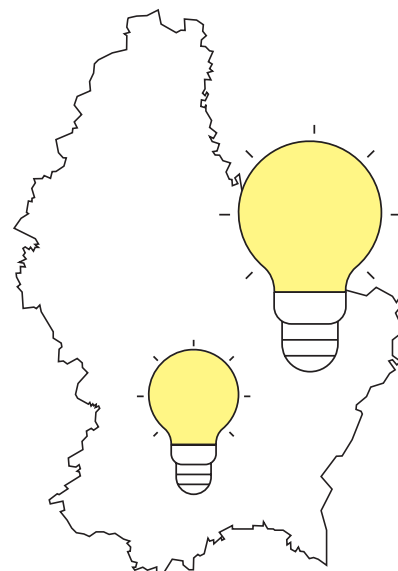
How do you see the Luxembourg ecosystem in 5 years from now?

I think there will be further consolidation. As the context evolves and we gain additional knowledge, some initiatives will disappear while others emerge. If we continue this way, Luxembourg will become internationally renowned as a solid and increasingly attractive ecosystem for entrepreneurs from Asia, the United States and other parts of the world looking to penetrate the European market. X

FROM START-UP TO SCALE-UP

They made it from Luxembourg

Today they are international, employing hundreds of people and generating revenues of millions of euros. However, they all started in Luxembourg with just a brilliant idea and a lot of enthusiasm.



MyScienceWork

Founded: 2010

mysciencework.com

MyScienceWork promotes easy access to scientific publications, unrestricted diffusion of knowledge and open science. Its database includes more than 90 million scientific publications and 12 million patents. Founded in 2010, the start-up, which has opened offices in Paris and San Francisco, proposes a data mining solution to analyse the scientific production and an innovative open source

solution for archiving data. “Luxembourg has been a key location for entrepreneurship for us, due to the numerous opportunities for financial aid available. We benefited from a lot of them and this helped us grow, recruit and start our American adventure,” says CEO and co-founder Virginie Simon. **X**

The start-up has designed a personalised online app for booking medical appointments, depending on the language, speciality and location of the doctor. Founded in 2013, Doctena has managed to become leader in its field in six countries – Luxembourg, Belgium, the Netherlands, Switzerland and Germany. The company currently employs 90 people and organises 1.4 million appointments per month.

“Luxembourg was the ideal place to serve as a proof of concept, with a much lower investment than if we had had to do it in a big city like London or Berlin,” says founder and CEO Patrick Kersten. **X**



Doctena

Founded: 2013

doctena.lu



Job Today

Founded: 2014

jobtoday.com

Founded in 2014 by two Russian residents of Luxembourg, Job Today is currently market leader in... Spain and the United Kingdom. The start-up has developed a hiring app connecting job seekers with the nearest employers looking for candidates. It has until now raised €41 million and manages a database of 5 million candidates. Job Today currently employs 50 people. "Luxembourg is a welcom-

ing environment for start-ups and will continue to be an important part of our DNA," confirms Eugène Mizin, co-founder and CEO. **X**

Governance.com was founded in 2014 with the objective of easing and keeping under control the numerous regulated processes the financial industry is facing. Its revenues have more than doubled for 3 years in a row. Today, the start-up serves over 20 financial institutions based in Luxembourg, Germany, Switzerland, the UK, Ireland and the US. "Luxembourg counts a vibrant, professional and growing financial

sector, with hundreds of top international banks and fund managers," CEO and co-founder Bert Boerman points out. "To connect these industry players with young innovative businesses, Luxembourg has made a major effort to build an ecosystem of support mechanisms, such as co-working spaces, accelerators and government support programmes." **X**



Governance.com

Founded: 2014

governance.com



Talkwalker

Founded: 2009

talkwalker.com

Founded in 2009, Talkwalker has developed a tool for the monitoring of the promotion, optimisation and protection of brands and their reputation on social networks. The company currently employs more than 240 people and has opened five offices outside Luxembourg – in New York, San Francisco, Singapore, Frankfurt and Paris. Its artificial intelligence programme monitors 150 million

brands all over the world. "There is no better place to start a business than Luxembourg. There is very little bureaucracy and it is particularly thanks to the support we have received from the government and start-up incubators that we have managed to grow so quickly," says Robert Glaesener, CEO of Talkwalker. **X**

PORTFOLIO INCUBATORS

Creating the right atmosphere for each start-up

Start-ups ideally require tailor-made offices adapted to their needs. Whether it is the oldest incubator in the country or the most recent one, the wide offering of premises for start-ups in Luxembourg provides something for everyone. A brief overview.

1



3



Photographs by Jan Hanrion,
Patricia Pitsch [Maison Moderne] /
Tomorrow Street / Paul Wurth



1. TOMORROW STREET

This public-private initiative helps start-ups to scale.

2. HOUSE OF STARTUPS

Hosts four incubators, one of which focuses on financial technologies.

3. TECHNOPORT

The country's oldest incubator hosts innovative and technology-based start-ups.

4. PAUL WURTH INCUB

Focuses on innovators in industrial technologies

5. LUX FUTURE LAB

Managed by a bank, it is open to all sectors.



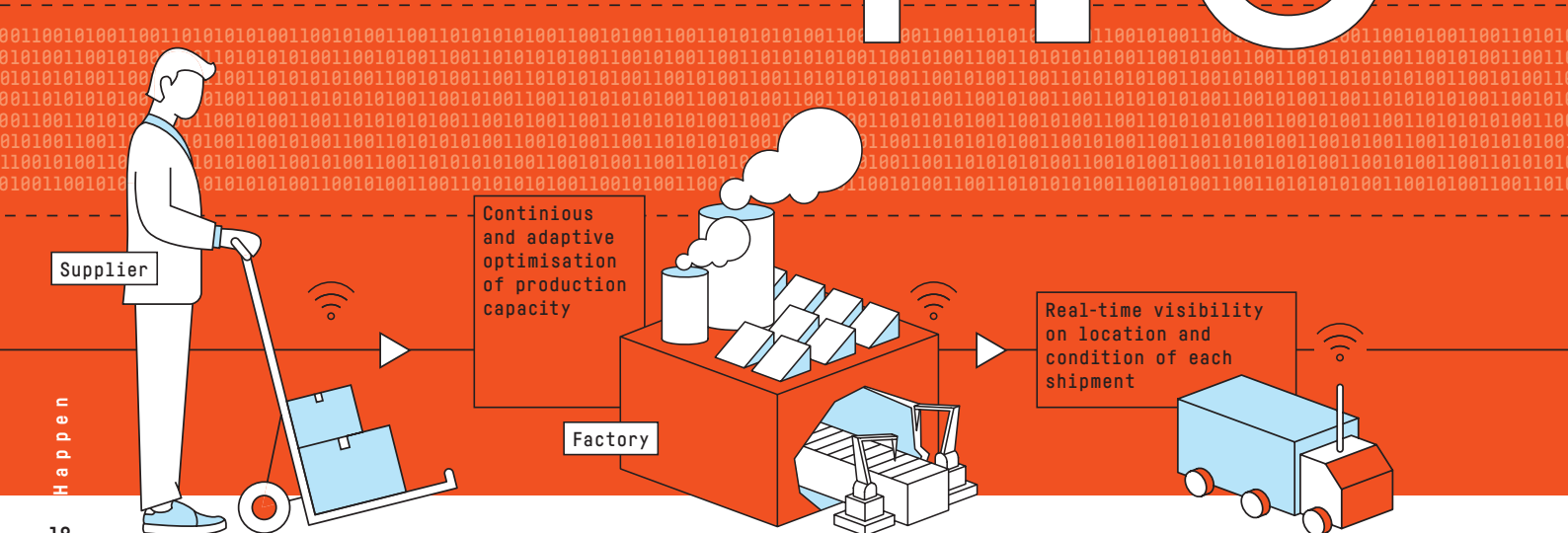
LOGISTICS AND SUPPLY CHAIN MANAGEMENT

62
The digital
futures

66
Transforming
supply chain services

Text by Marine Mombelli
and Lena Mårtensson >
Illustrations by Maison Moderne
[inspired by Mc Kinsey]

4.0

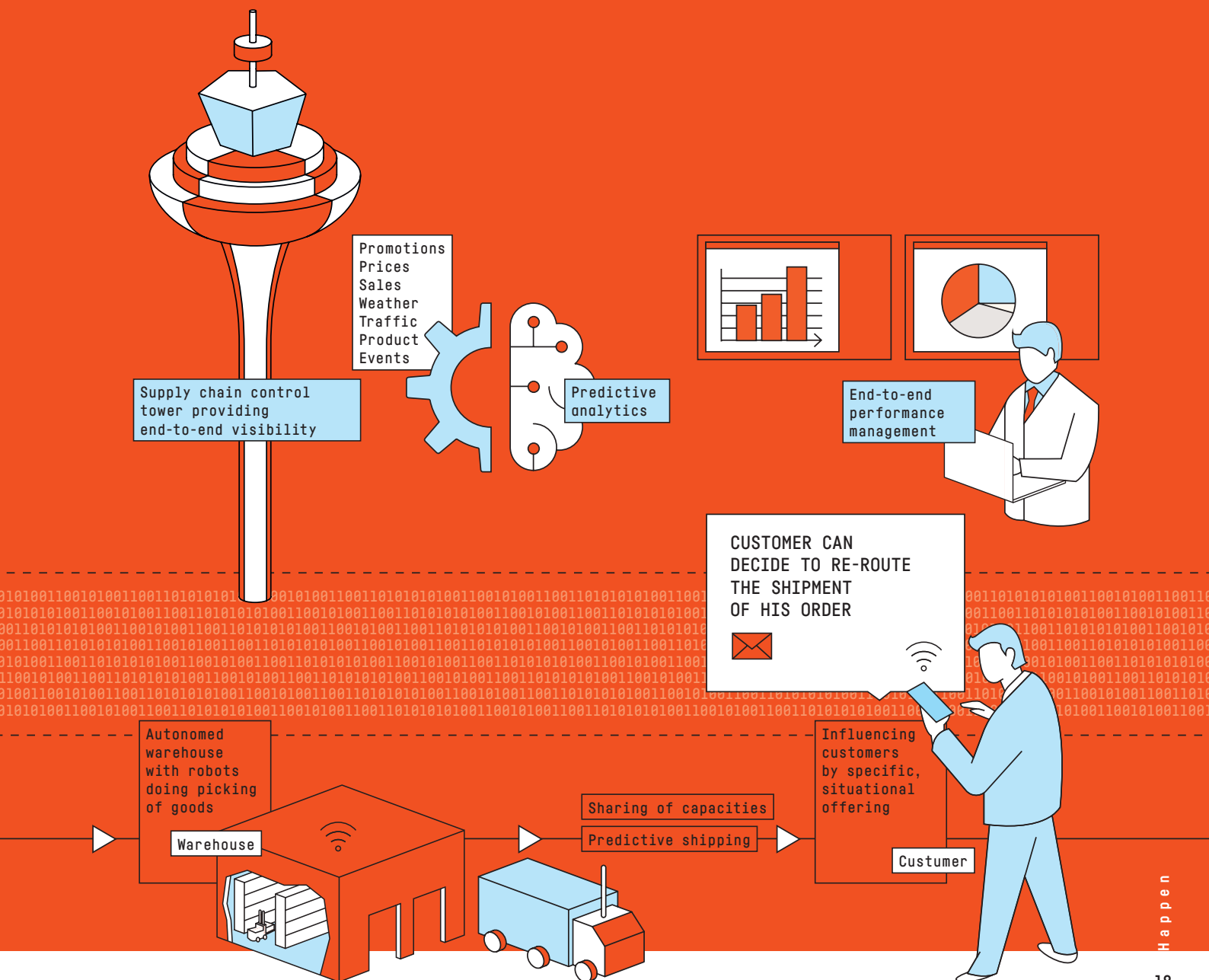


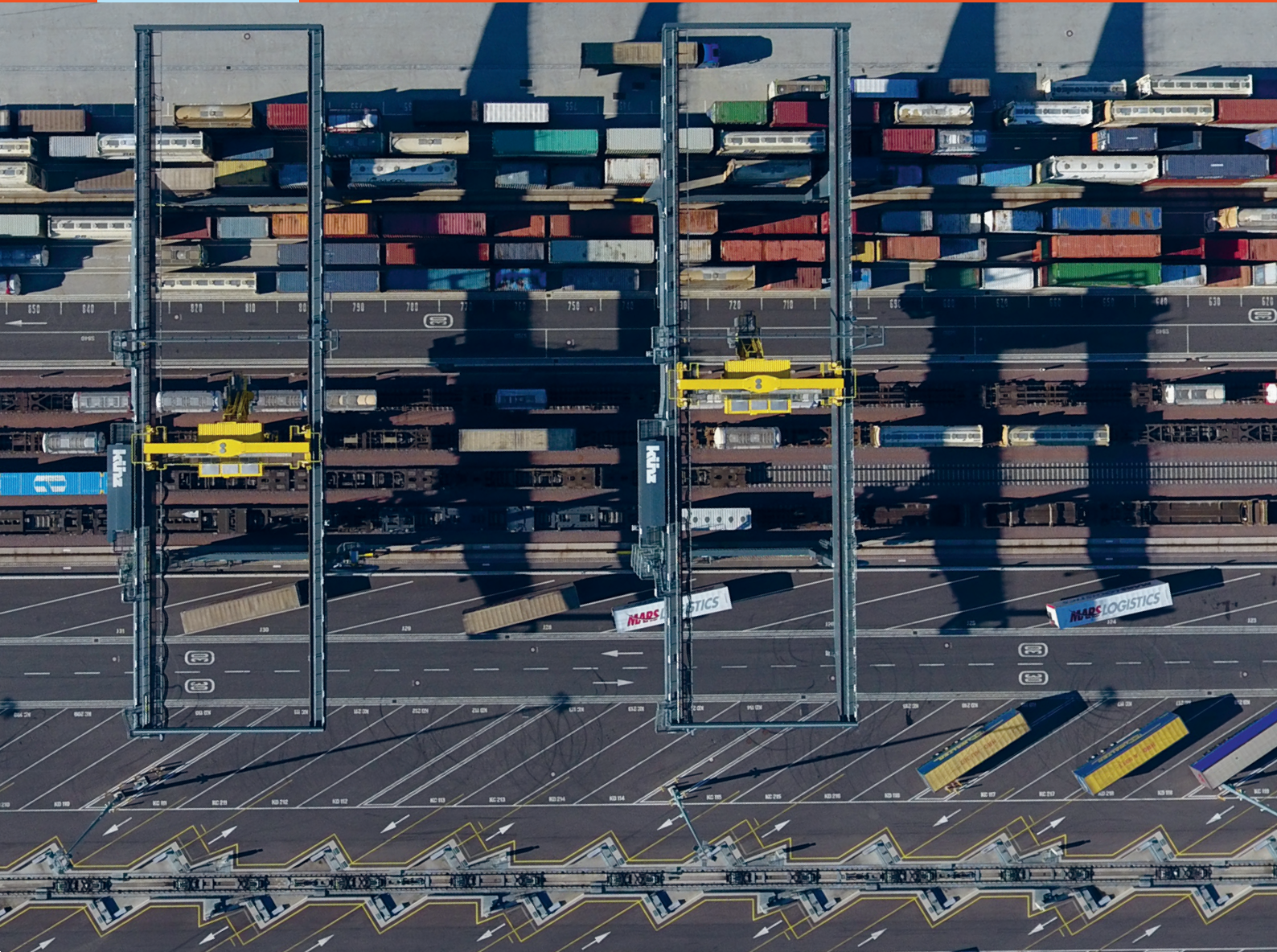
Digest:

Digitalisation, e-commerce and Industry 4.0: these three words are more important than ever. More than just buzz words, these new trends, which are generated by the development of new digital technologies, will strongly impact operations in the main sectors of the Luxembourg economy. They will have a major influence on logistics and supply chain management

activities, a field that is essential for trade and economic development. Digital technologies such as artificial intelligence, the Internet of Things and automation, coupled with big data, are already reshaping processes along supply chain networks and logistics activities. This development also paves the way for predictive data analytics that bring huge improve-

ments in terms of demand forecasting, inventory management, real-time end-to-end transparency and route optimisation planning. Logistics companies that strive to keep up with digitalisation can count on the efforts of Luxembourg, which has made digital logistics and supply chain management a government priority. **X**





LOGISTICS AND SUPPLY CHAIN MANAGEMENT

The digital future

Globalisation has largely influenced the operations of logistics service providers for decades. Today, it is time for them to embark on the journey of digital transformation.

"The 'holy grail' of supply-chain management today is predictive analysis."

Daniel Liebermann, Director,
Logistics Directorate,
Ministry of the Economy

The logistics sector is contributing significantly to the Luxembourg economy. The country's main assets include notably its central location in Europe, a modern logistics infrastructure, an innovative local ecosystem and the presence of major logistics service providers managing distribution centres for third parties.

Logistics 4.0

Just as digitalisation has radically changed the way we consume with a simple click of a button, Industry 4.0 will strongly influence the way logistics operations and supply chains are managed. In order for companies to successfully embrace this evolution, they need to move from linear supply chain management to a more interconnected model where information flows seamlessly between all stakeholders involved. Connectivity and interoperability of data are key.

"Over the past decade, logistics service providers in Luxembourg have successfully adapted to the changing global environment by continuously moving up the ladder

of the value chain. They offer dedicated services for special cargo such as pharmaceuticals or online purchases, for example," explains Daniel Liebermann, Director of the Logistics Directorate at the Ministry of the Economy. In order to strengthen its position as a prime logistics hub in Europe, Luxembourg is determined to support companies in succeeding with their digital transformation.

Towards customer-centric supply chains

With the rise of e-commerce and the emergence of the on-demand economy, supply chain management is becoming more complex. "Nowadays, consumers expect convenient and personalised delivery services. They are no longer the last link in the value chain, but an essential part of it," says Mr Liebermann. The higher expectations of private clients have set new standards along the whole logistics value chain. Digital-savvy business customers now expect similar services. Another major challenge is end-to-end supply chain visibility, covering the whole process from procurement to final delivery – and, when applying >

CHAMP & CARGOLUX

DIGITALISING THE LOGISTICS CHAIN

Websites

champ.aero | cargolux.com

Air cargo requires specific digital tools tailored to business needs. CHAMP is a leading supplier of integrated IT solutions to the airfreight community. These are primarily offered as Software-as-a-Service, running in Luxembourg-based data centres and accessed worldwide via the internet or dedicated networks.

Cargolux, Europe's largest all-cargo carrier, is in the midst of a profound digital transformation. Cargolux relies on CHAMP to manage its operational and financial flows. In parallel, it runs a number of in-house digitalisation projects, including:

TEAM (Turnaround Evaluation & Analysis Management):

A digital solution to monitor and analyse all elements in aircraft turnarounds in order to identify potential delay factors. The outcome allows all stakeholders involved to optimise their work.

eCRM: The digitisation of paper-based CRM [cargo movement requirement] to reduce paper waste and administrative costs and optimise trucking processes at the Luxembourg Cargo Centre.

Digital sales: A centralised tool to manage price and capacity requests and optimise how the company's capacity is sold on the market. The platform includes all elements required to provide a price offer, such as origin, destination, product requests, services, and availability. X

REDSPHER

A DIGITAL LOGISTICS PLATFORM

Website
redspher.com

Redspher combines technology and logistics know-how to deliver goods faster and smarter. Its starting point is that there is no limit to what digital technologies can offer.

"We wanted to kill distances and turn logistics into a competitive advantage. That's why we created a digital open platform that simplifies and facilitates on-demand delivery," explains COO Ignacio Tirado. The platform gives clients a single entry point to seamless logistics solutions provided by a network of different service providers. "We do not only help our clients find a transport solution, but the best transport solution. We put it in place, track it, audit it and even enable e-invoicing."

Present in 19 countries, the company has chosen Luxembourg as its base. "I'm originally from Chile, and Luxembourg gave me a visa when no one else would. The country is becoming a hub for logistics and digital innovation and we are glad to be part of this movement," says Mr Tirado. Redspher has also benefited from R&D and innovation subsidies. "The government support was very appreciated. What we do as Redspher would be impossible to do without digital means. It's like trying to imagine Amazon without the digital dimension, it would not exist!" X

the principles of the circular economy, even beyond. An increasing number of companies are looking to set up "supply chain control towers" to monitor and manage their global supply chains. It is no longer enough to use real-time data obtained through the Internet of Things just to track and trace goods – it needs to be turned into useful information. "The 'holy grail' of supply chain management today is predictive analysis," says Mr Liebermann.

Predictive data analytics

Big data analytics make logistical prediction possible on an unprecedented scale. While the day-to-day business can be managed with real-time monitoring, predictive data analytics allows operators to become proactive.

"With big data coupled with artificial intelligence, we can anticipate the impact of unforeseen events or external occurrences such as natural disasters. We are moving towards logistics solutions

that are more agile, more responsive and increasingly connected to the needs of the end customer," explains Mr Liebermann. Knowledge about how to forecast demand, predict disruptive, unforeseen events and take informed decisions on how to react is thus becoming a key strategic asset for companies.

A supportive ecosystem

Luxembourg's strategy for data-driven innovation includes a number of key initiatives targeting logistics companies. The government's ambition is to turn Luxembourg into a next-generation logistics 4.0 hub, where established logistics service providers consistently use digital technologies and new companies find a favourable ecosystem. The sector can benefit from innovation funding schemes and cooperation with public research institutes. "We strongly encourage public-private collaboration," confirms Mr Liebermann. "Companies that want to embark on a digital transformation will not be left on their own." X

FACTS

+700

The approximate number of logistics companies in Luxembourg. Together, they employ around 13,000 people. [Source: Ministry of the Economy]

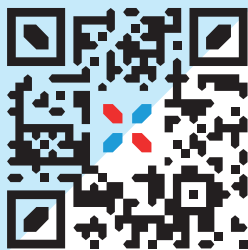
1.1bn

The annual contribution of the logistics sector in terms of added value to Luxembourg's GDP. [Source: Ministry of the Economy]



WHAT ABOUT LUXEMBOURG?

Scan for more information



www.tradeandinvest.lu

Discover a small country that is big thanks to the diversity of its dynamic economy, its political stability and its multicultural population.

Discover a country with first class ICT connectivity, at the cutting edge of technology. Develop your activities in an environment full of ideas and innovation.

Let yourself be carried away by the country's energy and entrepreneurial spirit.

Are you ready to take on new challenges? Luxembourg Trade & Invest is your trusted partner to support you in the development of your activities in Luxembourg and beyond.

LOGISTICS OPERATORS

Transforming supply chain services

Digitalisation strongly impacts logistics operations and supply chain management. For many of the leading companies in this field, it challenges the traditional way of working but also opens completely new opportunities to create value and improve competitiveness.

Digitalisation is a prime concern for numerous logistics service providers present in Luxembourg. Global logistics company Kuehne + Nagel and rail freight and logistics service provider CFL multimodal are among of them.

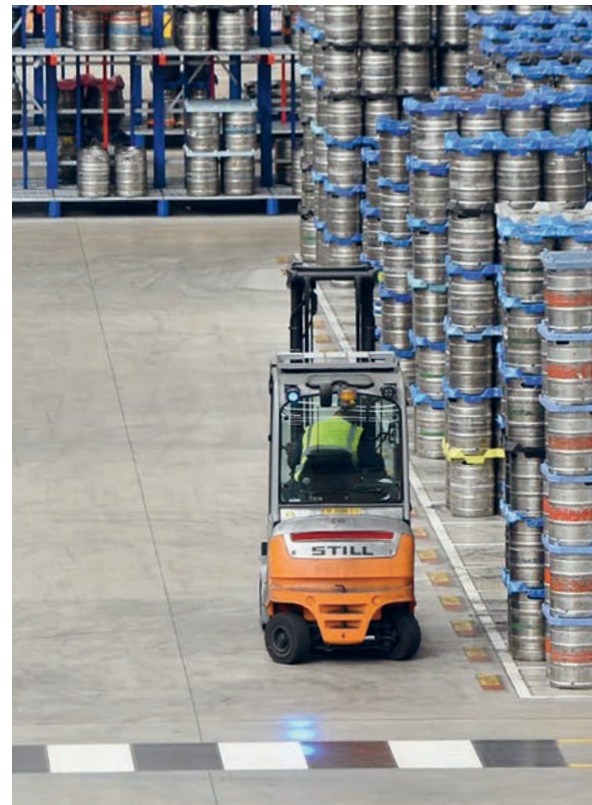
Data at the core

With almost 130 years of experience in the logistics business, Kuehne + Nagel started to invest early in its IT-driven supply chain management capabilities. Additional investments have allowed the company to become a so-called lead logistics provider (4PL), capable of managing not only its clients' complete supply chain but also aspects such as resources, technology and infrastructure. "Our logistics management services integrate highly developed automation and other digital systems,"

says Tobias Jerschke, managing director for Kuehne + Nagel in Belgium and Luxembourg. "We work with our own global network or with other logistics providers and can assure each party that their data is managed confidentially."

Kuehne + Nagel's Luxembourg hub manages the operations of both national customers and corporations shipping goods across the world. "The role of a global logistics company is to coordinate customers, partners and authorities in a compliant and qualitative manner. A wide range of data – financial information, logistics data, weather forecasts and congestion data, for example – flows through our systems. It is at the very core of our business," explains Mr Jerschke. "We use it to develop completely new services, such as predictive analytics using

Photograph by Kuehne + Nagel



virtual reality and artificial intelligence to anticipate issues that will occur in the near future.” These new developments are often carried out in partnership with innovative start-ups.

Bridging the gap

CFL multimodal is also undergoing digital transformation. A subsidiary of Luxembourg’s national railway company, it offers a broad service portfolio that includes combined and conventional rail freight as well as customs clearance, forwarding and logistics services. Historically orientated towards relying on traditional systems to maintain a maximum level of security, the railway sector is lagging behind when it comes to digitalisation. A delay that CFL multimodal is determined to catch up. Over the past few years, the company has

launched innovation activities aimed at preparing for future challenges, identifying and testing new opportunities and, in particular, avoiding being confronted with a potential disruption of the sector.

Several digitalisation initiatives are under way. “One of the best examples is the deployment of our tracking solutions for intermodal trains,” says Marc Valette, director for innovation and continuous improvement. By introducing solutions based on the Internet of Things, the company can now follow the movements of its international trains in real time, compare their actual movements to predicted timetables and detect any abnormal behaviour. Automatic alerts allow operators to focus on managing such issues, which considerably improves the services provided to customers.

Value creation

Other projects are being developed in fields spanning from human resources to automatic controls powered by artificial intelligence. The focus is on collecting data related to processes and equipment, but also to storage and handling operations. The challenge is then to find ways of exploiting and benefiting from this data.

“Digitalisation is not an end in itself, it can bring real value and should not only be seen as way to reduce costs,” Mr Valette underlines. A point of view that Mr Jerschke shares: “Data science and digital innovation are transforming supply chain operations from a cost factor into a competitive advantage.” X



VODAFONE

DIGITAL CAPACITY, INNOVATION AND TALENT

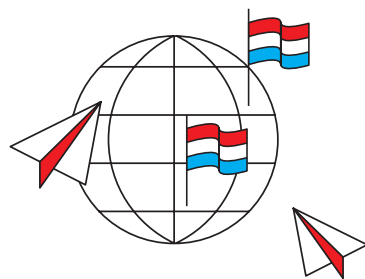
Website

vodafone.com

For the past 11 years, Luxembourg has been home to the procurement operations of Vodafone. The centre serves 24 Vodafone entities all over the world. The company is also in the process of establishing its centre of excellence in logistics and developing digital logistics solutions here.

“Our first realisation is a digital control tower that allows us to track and monitor the location and movements of all our network equipment worldwide in real time from Luxembourg,” explains Tolga Tomruk, Director of SCM Global Operations at Vodafone Procurement Company. The company is also developing a blockchain-based logistics application.

The next generation of Vodafone’s strategic suppliers is hosted at Tomorrow Street, an innovation centre run jointly with Luxembourg’s national incubator Technoport. Vodafone also conducts joint research projects with the centre for logistics and supply chain management at the University of Luxembourg. “The closeness to the university, and the growing community of companies that are starting logistics and procurement activities here, makes it easy for us to find talented people and grow our business in Luxembourg,” says Mr Tomruk. X



Local door openers for **BUSINESS**

DIPLOMATIC
AND
ECONOMIC
NETWORK

Facilitating global trade is a key focus of the different players in Luxembourg's diplomatic and economic network. Its members work hand in hand to ensure that doing business with and from Luxembourg is easy, transparent, and brings with it numerous advantages.



Text by Sue Hewitt and Lena Mårtensson >
Photographs by Ministry of the Economy /
from Gouvernement.lu

Luxembourg benefits from a broad network of representatives worldwide that can support companies in doing business from, and with the Grand Duchy. The diplomatic and consular network, under the authority of the Ministry of Foreign and European Affairs, provides advice and on the spot assistance to promote international trade and identify opportunities for economic cooperation. Spread across the globe, the network currently includes 37 diplomatic missions as well as around 150 general and honorary consuls. To further bolster its plans to diversify the Luxembourg economy and ensure the flow of information with embassies and honorary consuls, the ministry has also appointed an ambassador in charge of economic diplomacy.



Shufan Wu, Executive Dean, School of Aeronautics and Astronautics in Shanghai

“Europe and China are two fast growing regions representing the commercial space development frontier.”

In close collaboration with the diplomatic network, the Ministry of the Economy coordinates eight Luxembourg Trade & Investment Offices (LTIOs) in high-potential markets in the US, Asia and the Middle East. A ninth office is in the process of opening in Morocco. In addition, three economic advisors attached to embassies in India, Turkey and Brazil and seventeen foreign trade advisors enhance Luxembourg's economic promotion and support channels. The Chamber of Commerce has economic counsellors stationed at the embassies in Belgium, France and Germany.

An ideal launchpad

The LTIOs promote business opportunities in Luxembourg in their respective geographic regions and support Luxembourg companies that want to develop their activities abroad. A key focus is to assist companies that wish to expand their business to Luxembourg and enter into the European market. They also facilitate trade between their host countries and Luxembourg.

Working in close collaboration with the Ministry of the Economy, the

Chamber of Commerce and the national innovation agency, Luxinnovation, the LTIOs can support companies with general and sector-specific business information, tailor-made visiting programmes and practical help with setting up a company in Luxembourg. Together with the embassies and consulates, they can also assist companies in gaining access to high-ranking government officials and other key contacts.

In addition to this customised support, the LTIOs promote interesting initiatives such as the start-up acceleration programme Fit 4 Start (see page 54) to relevant companies. Several LTIOs have also used the yearly tech conference ICT Spring to encourage companies to come and see what Luxembourg has to offer. Attracted by the networking possibilities and perfect setting to find new business opportunities, a record number of start-ups from around the world travelled to the event in 2019.

The LTIO in Tokyo has been actively attracting start-ups to ICT Spring since 2012. “We try to attract Japanese start-ups that are interested in Europe in order to ➤

“Luxembourg’s location at the heart of the EU simplifies potential access to markets across Europe.”

Michał Kiezik, Business Developer, EAGLYS

position Luxembourg as a hub to enter the European single market,” explains Executive Director Yuriko Matsuno. “Investors such as bitFlyer and ispace joined the event before deciding to establish offices in Luxembourg.”

Exploring the market

Five Japanese companies joined in 2019. One of them, EAGLYS,

won the cybersecurity category of the “Pitch Your Start-up” contest that is part of the event. “As our products are oriented around cybersecurity with broad applications in banking and fintech, we decided to explore Luxembourg, a well-known hub for the global financial sector,” says the company’s business developer Michał Kiezik. “Luxembourg has an immensely

advanced data infrastructure and a thriving and competitive telecommunications industry. In addition, its location at the heart of the EU simplifies potential access to markets across Europe.”

Opened in 2006, the Consulate General and LTIO in Shanghai have established solid contacts with Chinese companies active in the innovation and new technologies sector as well as with the main incubators in the Shanghai region. The office has also used its network to successfully target Chinese tech companies and encourage them to discover Luxembourg via ICT Spring. “This year, China was well represented,” confirms Luc Decker, Consul General and Executive Director of the LTIO. “And this is only the beginning.”

Mr Shufan Wu, Executive Dean of the School of Aeronautics and



Astronautics in Shanghai, sums up his experience: “Europe and China are two fast growing regions representing the commercial space development frontier. For us, this event was very impressive in its scope and content.” James Chou, MD and CEO of incubator Microsoft for Start-ups North Asia, points out that “both Microsoft for Start-ups China and our portfolio of start-ups got good exposure to the European market”.

Strategic partnerships

To further increase Luxembourg’s international reach, the economic and diplomatic network plays a crucial role in creating long-term strategic partnerships with key organisations abroad that help local companies expand internationally and take advantage of Luxembourg to reach the European market. The Skolkovo Innovation Center is one such partner. This scientific and technological centre currently hosts over a thousand start-ups and established innovative companies. The Embassy of Luxembourg in Moscow, represented by the ambassador himself, actively contributed to the establishment of a long-term collaboration formalised through a Memorandum of Understanding (MoU) signed between Skolkovo and Luxinnovation. Subsequent events were organised at Skolkovo to present the economic landscape and opportunities offered by Luxembourg to Russian companies. Luxembourg’s size and the ease of doing business were at the heart of the discussions.

The LTIO in Seoul partnered with local Korean innovation agencies to attract 11 start-ups to ICT Spring in 2019. As a follow-up, during an economic mission to South Korea in May the same year, Luxinnova-

tion and KISED (Korean Institute of Start-up and Entrepreneurship Development) signed an MoU at a start-up event attended by Luxembourg’s Deputy Prime Minister and Minister of the Economy, Étienne Schneider. The agreement provides for greater collaboration between the two entities to support the development of the Korean and Luxembourg start-up ecosystems and to assist start-ups wishing to develop in one of the two countries.

Cracking the US market

The LTIOs in San Francisco and New York were instrumental in helping Luxinnovation set up accelerator programmes for Luxembourg high-tech start-ups to establish a foothold and be successful on the US market. In San Francisco, a 6-day start-up school was organised in conjunction with investor and accelerator Nex Cubed. A Benelux Catalyst event, a 4-week collaborative programme for aspiring start-ups from Luxembourg, Belgium and the Netherlands, took place in New York.

Where diplomacy meets business

The economic and diplomatic network is also there for Luxem-

bourg companies looking to explore and export to foreign markets. They can notably count on the ongoing support and expertise of the International Affairs department of the Chamber of Commerce. One example is the regular matchmaking event “Business Meets Diplomacy”, organised during the diplomatic conference uniting the heads of missions of the diplomatic network in May 2019. The event hosted 158 meetings between local companies and 45 ambassadors, consuls general and trade and investment officers. ODL, Luxembourg’s export credit agency, also took advantage of the occasion to present the array of financial incentives available to Luxembourg businesses for promoting products and services globally.

In this way, Luxembourg’s diplomatic and economic network is able to leverage local synergies and work to provide hands-on advice and support to investors, exporters, established companies and start-ups alike, to maximise success of Luxembourg businesses at home and abroad. **X**



Life in L U X E M B O U R G

People make places and Luxembourg is no exception. To prove it, we spoke to five foreign company executives about how they are helping shape the country's business landscape, why it's the best place to be for innovation and why the Grand Duchy is a great place to live.

Texts by Jean-Michel Gaudron > Photographs by Jan Hanrion



Cédric Spaas

- Founder and CEO, Arspectra
- From Belgium
- Living in Luxembourg since spring 2018

After having lived in the three neighbouring countries (France, Germany and Belgium), Cédric Spaas, 31, created his company specialised in 3D augmented reality for the medical sector in Luxembourg. “We were attracted by the start-up ecosystem and its acceleration programmes such as the Fit 4 Start for healthtech companies. In our field, we must be very responsive and rely on quick and effective networking.” He thus appreciates the ease of establishing national and international business relationships while being based in Luxembourg. The Museum of Modern Art (Mudam) located in the middle of the Kirchberg business district is one of his favourite places. “I love its light and its serene and modern aspect. The beauty of simplicity.” ✕

More on video:
tradeandinvest.lu/cedric-spaas



Corinne Lozé

- CEO, Orange Luxembourg
 - From France
 - Living in Luxembourg since February 2019
-

After almost five years spent developing the Orange network in Central Africa, Corinne Lozé took over the management of the French telephone operator's Luxembourg subsidiary at the beginning of 2019. "Luxembourg is a very dynamic country," she says, having been greatly impressed with its open and cosmopolitan nature. "It's even better than I thought!" In a very competitive telecom market, "business here is exciting, especially with 5G projects and all the innovations associated with such initiatives".

A lover of wide-open spaces, Mrs Lozé likes to walk in the Mullerthal region in the east of the country, "a particularly beautiful landscape and a great place to unwind". X

More on video:
tradeandinvest.lu/corinne-loze





Piero Cavigliasso

- Group Innovation Technology Director, Guala Closures Group
- From Italy
- Living in Luxembourg since 2017

Piero Cavigliasso, 55, came from Italy at the end of 2016 to start-up the Luxembourg R&D centre of the Guala Closures Group, world specialist in wine and spirits bottle caps. He settled down with wife and 3 girls eight months later. He found a fulfilling environment there. "The main aspect I appreciate is the high level of organisation in the public sector and public services. This is probably the main difference with my beloved Italy. I also like the good attitude of most people, all focused on doing things rather than complaining about things that are not done." One of Mr Cavigliasso favourite spots in the city of Luxembourg is the spectacular panoramic elevator (65 metres) in the Pfaffenthal district "A modern place in the historic centre. I like this 'symbolic' mixture of tradition and modernity." ✕

More on video:
tradeandinvest.lu/piero-cavigliasso

Marie-Hélène Massard

- CEO, AXA Luxembourg
- From France
- Living in Luxembourg since 2012

Arriving in Luxembourg in 2012 after five years in Poland, Marie-Hélène Massard discovered “a country on a human scale, with a lot of dynamism and the will to reinvent itself to remain competitive”. Chief Executive Officer of one of the country’s leading insurance companies and Chair, for two years, of the Luxembourg association of insurance companies, this 46-year-old Frenchwoman was able to appreciate the quality of public-private partnerships in Luxembourg: “they work well and are a catalyst for business innovation and growth.” She likes the Place de la Constitution “and the very beautiful view from the foot of the Gelle Fra (“Golden Lady”) statue, a woman who symbolises freedom and resistance.” X

More on video:
tradeandinvest.lu/marie-helene-massard





Genna Elvin

- Co-founder TadaWeb, 7 years
- From New Zealand
- Living in Luxembourg since 2012

After leaving her native New Zealand at the age of 22, Genna Elvin landed in Luxembourg in 2012 and discovered a country full of charm. “It’s very central, unlike my home country, and the business landscape is very favourable to start-ups,” she says happily. “And the Belval site is very exciting: you can find everything you want there, in a superb setting.” As co-founder of TadaWeb, a growth-phase start-up specialising in the automation of data-search processes on the Internet, she particularly appreciates the country’s multicultural environment. “You can come from anywhere, and most people are fluent in English, which really facilitates contacts. Luxembourg is really a forward-looking country, ready to make the necessary changes”. ✕

More on video:
tradeandinvest.lu/genna-elvin

It happened **1st** in Luxembourg

While others talk, Luxembourg acts. An audacious solution for having less cars on the road, blockchain experimentation and a new certification for biobanking: Luxembourg leads the way.

Texts by Jean-Michel Gaudron > Illustrations by Maison Moderne

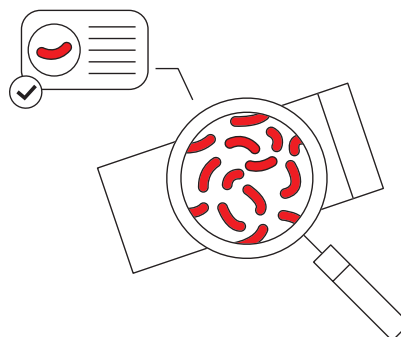


Free public transport

The media around the world, and even the American Senator Bernie Sanders, have announced the news: as of 1 March 2020, national public transport (trains, buses and tram) will be completely free throughout the whole country of Luxembourg. The same applies to buses in the City of Luxembourg. **X**

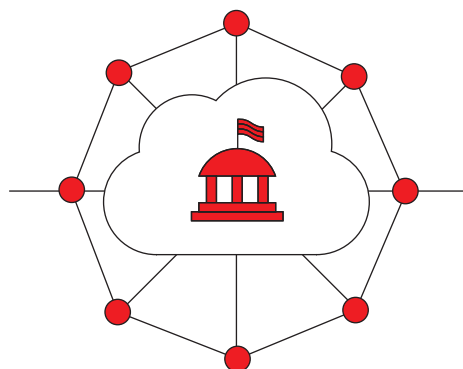
Microbiome components identification

IBBL (Integrated BioBank of Luxembourg), an autonomous non-profit institute that supports biomedical research for the benefit of patients, is the first biobank in the world to be accredited for the identification of microbiome components. Its method makes it possible to identify, not only a single bacterium, but the entire bacterial population of a sample of any type. This gives scientists a comprehensive and reliable overview allowing them to progress in their research. **X**



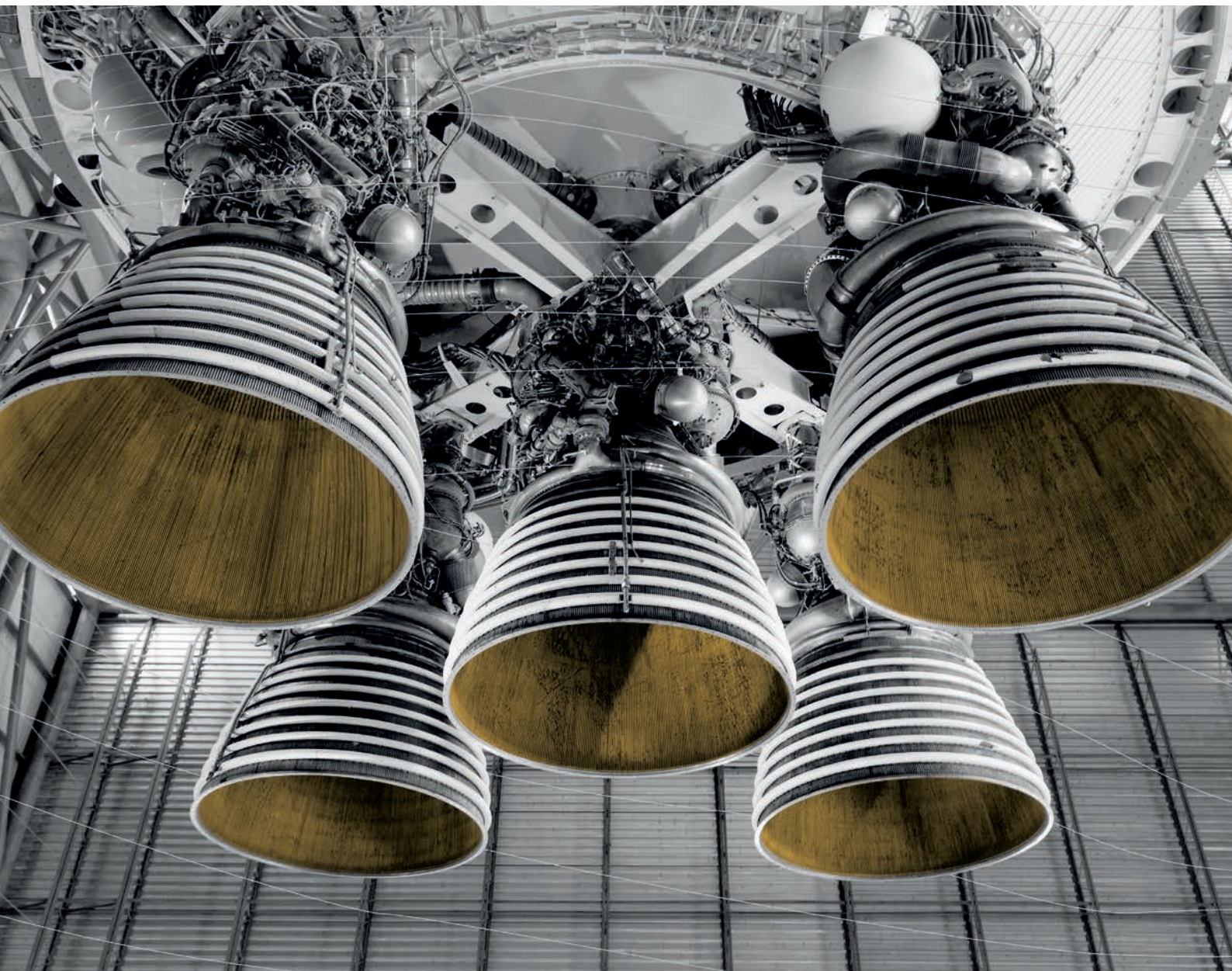
A public blockchain

After becoming home to the first e-embassy in the world, Luxembourg once again proved to be a forerunner in May 2019 with the creation of a blockchain for the public sector. According to Marc Hansen, Minister Delegate for Digitisation, this project makes it possible to experiment and develop a series of new applications enabling interaction between the public and private sectors. "This first experience will help us better understand the opportunities and advantages offered by this technology. Above all, it is essential that we equip ourselves with the means to take advantage of blockchain technology and develop technological and legislative expertise that will be very useful to us in the future," explained Mr Hansen. **X**



your legal, tax and
business services firm
in Luxembourg

arendt



your partner in innovation

arendt.com

DRINK PURE WATER!
Choose hydrogen RO
Water purifier



Hydrogen-rich Reverse Osmosis Water Purifying and Drinking Machine

● 4 Stages purification

Remove sediment, rust, large particles.
Remove residual chlorine, odor. Descaling.
Inhibits microorganisms, organic matter.

● Weakly alkaline strontium rich water

Rich in strontium, rich in trace elements.
Weak alkaline water, better taste.

● Hydrogen rich water

High concentration hydrogen: 2000ppb.
Hydrogen and oxygen separation,
with small molecule water, make cells
easier to absorb water.

● 3 Seconds Rapid heating

Thick membrane, water boils in a lot less
time, in just 3 seconds. Fresh water.

● Easy filter change

Quick connector installation, easy to
disassemble, quick change filter.

● Special Design

Food grade material, 3:1 low waste water
ratio, 6L large water tank, desktop free
installation, promise thermostat.

We're waiting for you in our Showroom to show our products in the air and water sector. With our products you can live in your home in full Health.

Showroom:

26, rue de Cessange L-1320 Luxembourg • +352. 661 345 300

www.luxcleanair.com • marketing@octartech.com



OCTAR TECHNOLOGIES
CLEAN AIR AND WATER FOR A BETTER LIFE