

# progress report.

spring 2018.



**digital**  
**luxembourg**  
innovative initiatives.

# contents

## foreword

by Xavier Bettel.

01  
p—04

## about

digital luxembourg.

02  
p—06

## missions

positive transformation.

03  
p—09

## figures

let's get DIGIT-al.

04  
p—13

## milestones

20 biggest moments.

05  
p—17

## priorities & initiatives

skills. — p 24

ecosystem. — p 32

policy. — p 40

government. — p 48

infrastructure. — p 54

06  
p—21

by Xavier Bettel.

Photo: Marion Dessard / Paperjam

# building bridges, breaking down silos.

It is impossible to talk about Luxembourg's future without mentioning digitalization. They are one & the same. The strength of our society & economy will become more & more a reflection of our ability to tap into digital opportunities.

**Digitalization moves fast & waits for no one.  
Luckily, Digital Luxembourg was designed  
to move faster & prepare everyone.**

New technologies impact all areas of life, so our response is an initiative that works holistically & collaboratively. Success in the digital era demands from us a new level of cooperation & multidisciplinary innovation.

In this landscape, silos must give way to bridges between all sectors & demographics. We are convinced that collaboration is the key to Luxembourg's modern strength. By working closely with ministries, researchers, innovators & companies, Digital Luxembourg helps forge collaborative solutions that propel our shared transformation.

Digital Luxembourg embraces inclusion – welcoming diverse perspectives, pooling knowledge & distributing ownership. Through this initiative, we support & enable projects that reflect a national digital strategy & lift the entire country.

**Instead of a prescribed recipe, Digital Luxembourg approaches each project uniquely, contributing value & accelerating success in any way possible.**

Positive digitalization should have a nationwide impact, so its team supports a wide variety of ideas & innovations, regardless of origin or focus.

As your government, our purpose is to position each & every citizen to thrive today & tomorrow. To do so, we pursue collective transformation — not top-down or sector by sector — to elevate the whole.

For effective & efficient action, Digital Luxembourg reports directly to me & remains fluid by design. Rather than a peripheral undertaking, digitalization is central to this administration. As new technologies inevitably redefine our world, Luxembourg will be ready to shape & harness them.

Whether expanding our ICT infrastructure or upskilling our workforce, Digital Luxembourg focuses its energy & resources on priority areas that strengthen the whole & help the country progress.

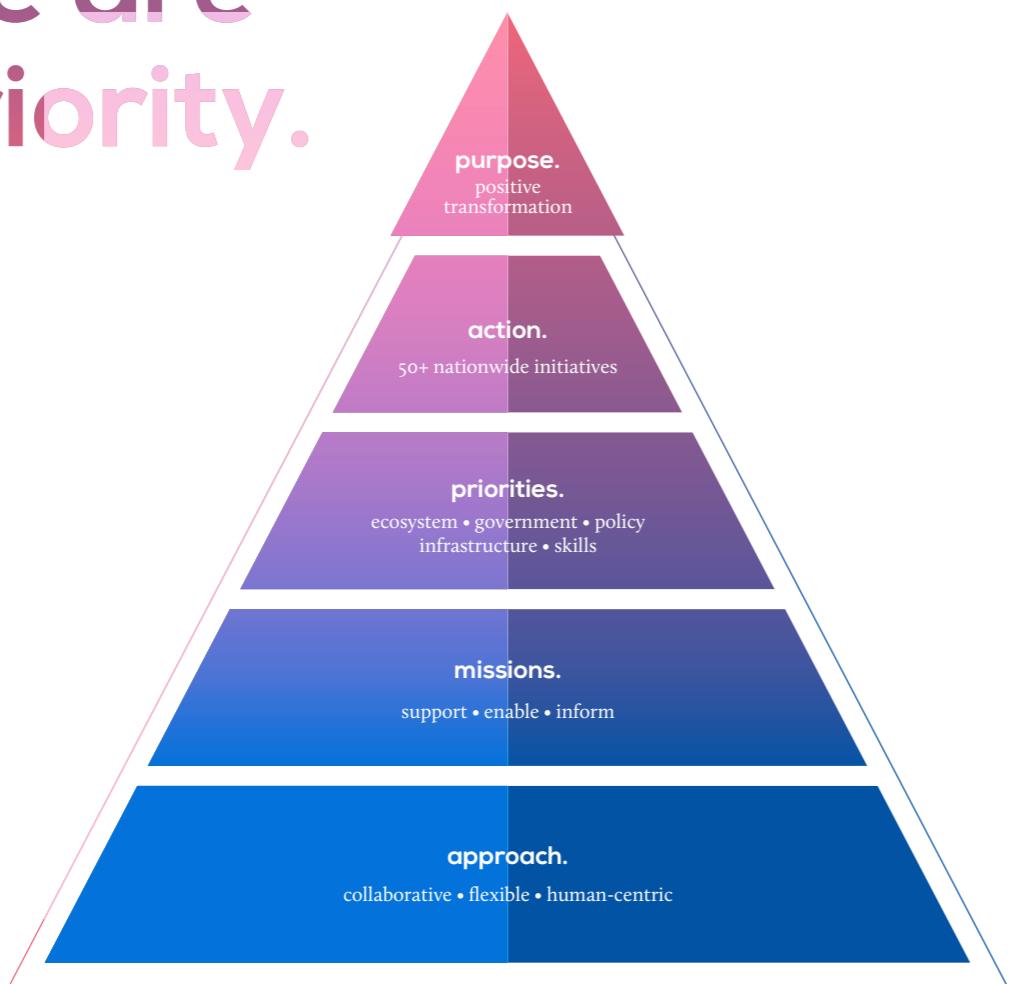
In that spirit of unity, this special initiative acts as the nucleus of all nationwide digitalization efforts, providing both a global platform & a local support system. *Digitization* was about technology. For us, *digitalization* is about empowering people & businesses to flourish in a digital landscape.

Thank you to all of the bold innovators & curious minds in the public, private & academic realms who are using digital tools to drive positive change in Luxembourg.

**We are all in this together.**

— **Sincerely,**  
**Xavier Bettel**  
**Prime Minister of Luxembourg.**

**transformation  
is the aim.  
digitalization  
is the avenue.  
people are  
the priority.**



**It's not about technology's potential.  
It's about yours.**

Digital Luxembourg is both a uniting force behind Luxembourg's digitalization movement & its biggest ally. We are an inclusive, multidisciplinary government initiative that strengthens & guides the country's digital efforts.

Our goal is simple: transformation via positive digitalization. To achieve this, we employ a horizontal approach that is, above all, collaborative, flexible & human-centric.

Launched in 2014, Digital Luxembourg is a result of the government's commitment to thriving in an evolving, modern landscape. Digitalization has brought with it endless opportunities. Luxembourg wants to position itself & its citizens to benefit fully from that movement.

Our style meshes big-picture awareness with a just-do-it attitude. Whether writing data regulations, simplifying procedures or triggering conversations, we keep innovation moving.

Digital Luxembourg identifies & supports efforts that positively impact the country, from young ideas to established initiatives. We also work to raise the visibility of digitalization in Luxembourg among citizens & abroad.

For the biggest impact, our focus is on modernizing & future-proofing five key areas: Government, Skills, Policy, Infrastructure & Ecosystem.

# missions

positive transformation.

03  
p—09

# harnessing digitalization as a tool for positive transformation.

## enable



### a lifeline for impactful ideas.

Luxembourg's progress hinges on innovators bringing their ideas to life. Each time a discovery slips through the cracks, an opportunity is lost. Digital Luxembourg helps get promising projects off the ground. We clear a path to success by securing the necessary connections, resources & conditions. Seamless transitions from idea to reality mean faster nationwide transformation. Once these initiatives are off & running we hand off the baton to the ideal project owner. By pinpointing gaps & coordinating development efforts, Luxembourg makes progress, project by project.

## support



### a helping hand for digital projects.

Digital Luxembourg supports initiatives that strengthen our mission of transformation through digitalization. By officially endorsing them, we hope to bring visibility & credibility to their endeavors. In certain cases, we also make strategic financial contributions. As a high-level initiative with a flexible approach to support, we are perfectly positioned to aid a wide spectrum of projects. An endorsement from Digital Luxembourg highlights their key roles in the nation's digitalization movement. It also acknowledges the project's sound strategy, ethical practices & transformative potential.

## inform



### a spotlight for digitalization efforts.

New initiatives are popping up left & right. Public, private & academic actors are playing their part to advance digitalization. We provide the stage to ensure that they are heard. Shining a spotlight on these activities benefits their brands & puts digitalization on the public's radar. Communication is the first step to engagement. Through one online platform & regular outreach, Digital Luxembourg acts as a unifying force behind the country's digital activities. Regardless of where these initiatives originated, we want to give them the attention they deserve while raising awareness about digital projects within Luxembourg & abroad.

# figures

let's get DIGIT-al.

04  
p—I3

**20+**

spaces to innovate.

**1st**

data embassy in the world.

**150%**growth in luxembourg's  
# of ICT specialists  
from 2015 to 2016.**€20 million**available seed funding  
via the Digital Tech Fund.**6<sup>th</sup>**EU ranking in open data  
maturity (2017).**12**government regulations & policies  
that boost innovation.**3<sup>rd</sup>**place among OECD  
countries in internet usage of  
residents (2016).**7<sup>th</sup>**place in the EU  
for usage of digital public  
services (2016).**50+**

nationwide digital initiatives.

**1st**place in EU digital skills  
ranking (2017).

# milestones

the movement's 20 biggest moments.

05  
p—17

# milestones

the movement's 20 biggest moments.

05

p-18

2015

2016

2017

2018

months

j.

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2014

## Digital Luxembourg

Multidisciplinary government initiative launched to unify & strengthen the country's digitalization.

**Digital Admin. Principles**  
Adoption of Digital by Default, Once Only & Transparency principles.

**Free WiFi**  
Temporary free city wifi turns into a permanent service.

**Fit4Start**  
New program arrives to help early-stage startups.

**Fit4Coding**  
Additional aid for jobseekers joins the ecosystem.

**Makerspaces by Bee Creative**  
New project prepares youth for a digital world, establishes makerspaces in public schools & holds first Makerfest the following year.

**EduSphere**  
A digital learning & teaching environment launches.

**Legilux.public.lu**  
Machine-readable legislation goes public.

**Future Hub**  
Label created for schools promoting digital education.

**SMB Digitalization**  
New program helps companies go digital.

**Open Data Portal**  
Online platform created & first open data hackathon soon follows.

**Digital Tech Fund**  
€20-million seed fund established thanks to public & private investors.

**FNR PayPal Chair**  
A collaboration to demystify digital technologies & forge connections between regulators, industries & users.

**Infrachain**  
Not-for-profit blockchain solution enters the scene.

**National Digital Acceleration**  
New public-private partnership with Cisco in 4 key areas: education, IoT, cybersecurity & fintech.

**Virtual Reality**  
Digital Luxembourg stimulates VR content creation and merges art with tech.

**Data Embassy**  
Luxembourg & Estonia announce world's first data embassy.

**GDPR Tool**  
Public tool makes compliance easier for companies to achieve.

**Open Data Strategy**  
Government presents policy of transparency & openness.

**to be continued.**

# priorities & initiatives

tackling innovation from every angle.

06  
p—2I

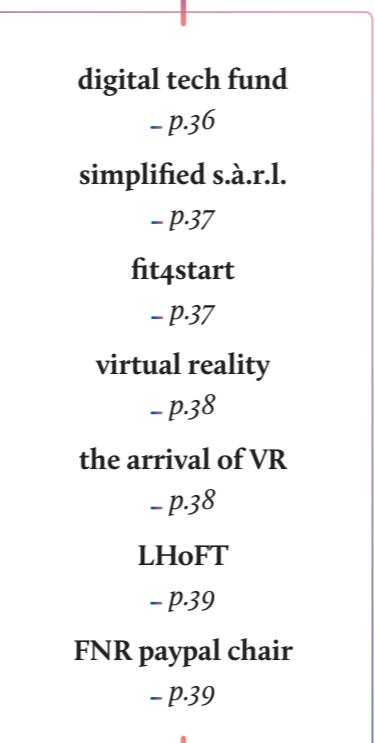
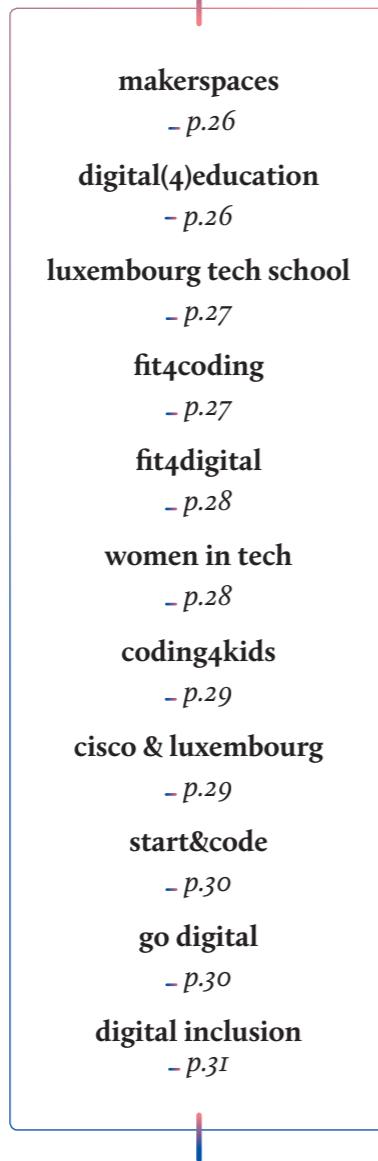
# priorities & initiatives

tackling innovation from every angle.

**priorities**  
five strategic areas.



**initiatives**  
progress, project  
by project.



## — overview

Since we cannot squeeze all of the country's digitalization efforts into one little progress report, here is a partial glimpse of the types of activities that are molding Luxembourg every day.

**policy.**

- automated meta-data extraction from legal texts (MELT) - p.44
- open data regulation - p.45
- free flow of data regulation - p.45
- GDPR - p.46
- CST for GDPR - p.46

**government.**

- digital by default - p.50
- einfach lëtzebuerg - p.51
- data embassy - p.51
- myguichet - p.52
- open data - p.52

**infrastructure.**

- broadband - p.58
- free wifi - p.59
- high-performance computer - p.59
- 5G rollout - p.60
- AI mapping - p.60
- infrachain - p.61

## priorities & initiatives

skills.

# skills

## the doorway to digital opportunities.

The digitalization movement brings with it opportunities as infinite as our imaginations. With the necessary skillsets, every single citizen can reap its benefits. An emphasis on digital literacy, inclusion & awareness ensures that all of society can prosper in these rapidly modernizing times. A tech-savvy workforce, empowered by diverse training programs, is a country's strongest foundation. By equipping today's employees & younger generations with the ability to harness technology, we ensure that digitalization positively affects all of us. A population with access to ICT education becomes a driver of innovation & can face change with confidence.



### key objectives

#### — urgent skills

*Quick solutions for the now*

Tackling Europe's current digital skills shortage with recruitment events & trainings

#### — future readiness

*Smart preparation measures*

Identifying & developing future-proof skills for tomorrow's labor landscape

#### — supply & demand

*A balanced digital economy*

Bridging the gap between education & the job market with supplementary programs

#### — digital for all

*Diverse, accessible opportunities*

Promoting digital literacy, inclusion & awareness so no one is left out of the digital movement

### areas of interest

#### — youth

*A digital doorway in every school*

Sparking childhood interest in technology via coding & app-based learning

#### — ICT specialists

*Simplified recruitment*

Fighting the skills shortage through IT matchmaking events & favorable legislation

#### — professionals

*Ongoing ICT development*

Turning your company's existing talent into the skills it needs through employee training

#### — citizens

*Public awareness*

Promoting digital skills, education, training & jobs across Luxembourg

**A strong digital economy boils down to empowered individuals.**

# priorities & initiatives

skills.



*our role in the initiative*

## makerspaces



**tech tools for infinite invention.**

The power of makerspaces stems from their simplicity. These safe havens for creativity & experimentation transform school facilities into temples of discovery. Here, young people learn that their resourcefulness has no limits, as they apply new media to realize their own digital projects. Equipped with robots, 3D printers & laser cutters, youth come face-to-face with the potential of modern technology. Every child, regardless of social background, should have this opportunity to utilize ICT tools & benefit from modern educational resources. With six established makerspaces, which were first launched in 2015 by BEE Creative as part of the global Digital(4)Education strategy, Luxembourg is raising a growing community of makers.

a project by —



## digital(4)education



**equal opportunities for innovation.**

In 2015, the Ministry of Education, Childhood & Youth unveiled Digital(4)Education, a strategy for developing skills & know-how fit for the 21st century. Its mission is to prepare young people for a professional landscape of rapid & permanent change. Through apprenticeship programs & innovative educational projects that bring digital technology to youth, it will inspire future ICT experts & entrepreneurs. The Bee Creative program, launched as part of this strategy, focuses on improving the digital skills of young people in Luxembourg & building a digital culture, including via the introduction of makerspaces within schools. The FutureHub label, introduced in 2017 to recognize secondary schools committed to new technologies, also reinforces ICT education.

a project by —



THE GOVERNMENT  
OF THE GRAND DUCHY OF LUXEMBOURG  
Ministry of Education, Children and Youth

## luxembourg tech school



**empowering future techies.**

At the extracurricular Luxembourg Tech School (LTS), 15-20-year-old students fan their passions for the digital realm & hone their understanding of digital applications. The program, which rotates between different schools, lets pupils dive into coding, game development & big data analysis. These digital leaders of tomorrow simultaneously learn how to run a project from start to finish to commercialization. Currently, the program serves nine schools & over 90 students, having grown by roughly three times since its launch. LTS never stops looking for new opportunities to empower future digital technology professionals. Its 3 Times 3 Months program does just that in the fields of gaming, big data & fintech. With a positive feedback rate of over 83 percent, many students have asked us about next year. The plan is to take it to the next level with LEVEL UP! This new program is even more spectacular & focuses on space resources & AI for finance.

a project by —



THE GOVERNMENT  
OF THE GRAND DUCHY OF LUXEMBOURG  
Ministry of Education, Children and Youth

## fit4coding



**90 coders in 18 months.**

What if you could go from novice to working coder in three short months? Fit4Coding turns participants into developers within the space of a single season. Upon completion of the course, they can rejoin the job market in a completely new industry. For students, entrepreneurs, IT specialists & curious minds, this program provides the chance to redirect career trajectories overnight. Fit4Coding sets out to train 90 coders in the space of just 18 months, a response to rising local demand for skilled workers. Now in its sixth season, the program, which takes place at WebForce3 within Technoport, equips coders with essential skills in merely 490 hours of training. The ambitious endeavor proved to be a massive success, with 80 percent of participants graduating & finding work as developers within three months. Its effectiveness earned it a Best Practice award at the 2017 European Digital Skills Awards.

a joint project by —



*NumericALL*

## priorities & initiatives

skills.

### fit4digital



a digital edge.

Information technology applies to every person & every industry. Business owners looking to boost profits, efficiency or service quality, can employ IT to unlock all three. The Fit4Digital program is the starting point for businesses ready for a digital transformation. The program begins with an analysis of your company & the ICT solutions that would deliver the highest impact. You then receive concrete recommendations on how to implement tools that will improve your competitiveness. Professional, neutral experts approved by Luxinnovation accompany & advise you through every step of your transformation. The program finishes with employee training on adopted IT tools so that you can continue your digital efficiency without missing a beat. Ultimately, program participants can improve long-term performance, increase total turnover & digitalize much of their operations.

a project by



### women in tech



a successful digital movement is a diverse one.

The full expression of digitalization will only happen when every segment of society can participate. To benefit completely from the digital movement, the entire community must rise to meet it. Digital Luxembourg enables & supports initiatives that promote groups who are underrepresented in tech, women being one of them. Digital Luxembourg & Women in Digital Empowerment (WIDE) organize free Rails Girls one-day workshops to introduce girls & women to coding. Participants of the program create web applications from scratch using the Ruby on Rails programming tool. This international concept brings together women & young girls who might otherwise never explore the tech world – a male-dominated stronghold. Check out WIDE's other game-changing initiatives at wide.lu.

a project by



### coding4kids



an introduction to programming.

For many adults, let alone children, coding is a vague & foreign concept. The best way for anyone to fully grasp it is to get their hands dirty. Coding4Kids, an initiative of the Code Club in collaboration with the National Youth Service, gives each child a gateway to first-hand programming experiences. During these workshops, they learn about coding: its potential, how to create through coding & how to use related tools. These first impressions are crucial, so organizers make sure that the course is fun, engaging & separate from traditional school programs. Code Clubs exist throughout the country, teaching residents in different communes how to code. By bringing this resource to communities beyond the capital, Code Club is diversifying the digital economy.

a project by



### cisco & luxembourg



partnering for digital acceleration.

Leading technology company Cisco is teaming up with the Grand Duchy to help accelerate its country-wide digitalization. The three-year partnership will be centered on education, cybersecurity, internet of things & fintech. Cisco's expertise & resources in these areas will strengthen Luxembourg's position as a digital leader. As part of the agreement, Cisco will launch a Networking Academy at the University of Luxembourg, speeding up local IT skills development & helping drive the digital economy. This is the 17th country that Cisco has worked with as part of its Country Digital Acceleration strategy to globalize digitalization. Prime Minister Xavier Bettel & Cisco CEO Chuck Robbins signed the memorandum of understanding at the World Economic Forum.

a project by



## priorities & initiatives

skills.

### start&code



become a coder in six weeks.

Launched in 2015 by INCO & financed by the JPMorgan Chase Foundation, Start&Code turns young people into coders with lightning speed. Its decision to focus on Android programming & Java highlights an emphasis on employability. The goal-oriented program seeks to prepare participants for the modern job market with relevant skills, integration training & placement. Of the first group of 90 trainees to complete the intensive, six-week program, 15 percent were refugees. Attendees were mainly selected by ADEM, Luxembourg's national employment agency. Start&Code cares about results, so support extends beyond coding into the application & onboarding phase. This program turns the technology boom into an immediate opportunity for any motivated individual. Start&Code improves both the employability of young people who have had difficulty finding jobs & the integration of refugees in the Grand Duchy.

a project by



### go digital



transforming SMEs & VSEs.

To mold the strongest possible digital economy, inclusion is key. Fit4Digital by Luxinnovation provides in-depth analysis, consulting & guidance to help companies incorporate digitalization & improve their own operations. This effective initiative inspired the creation of Go Digital, which shares the mission of helping companies digitalize. However, this adaptation homes in on businesses that want to go digital but do not necessarily have the financial means to take advantage of Fit4Digital's extensive program. Go Digital is a lighter version of the flagship initiative with multiple phases, professional tools and hands-on workshops. Each of the 96 workshops focus on different areas of SME digitalization: visibility, reputation, customer acquisition, business models & beyond. By attending any of these courses, entrepreneurs will quickly grasp that digitalization, e-commerce & social media brings real added value to their operations. Go Digital aims to evaluate & guide businesses, while helping them take matters into their own hands.

a project by



### digital inclusion



tech, skills & autonomy for refugees.

Nowadays, being online is synonymous with staying connected to society. It is where we find jobs, contact loved ones, get information & discover services. Refugees arriving in Luxembourg already face an array of challenges. Digital Inclusion ensures that access to the digital economy & society is not one of them. Its original goal was to refurbish computers & give one to every refugee family. Having passed the 1,000-computer mark & hired a team of volunteers & employees, Digital Inclusion is still going strong. The computers, laptops & more recently, smartphones are refurbished mainly by refugees, who receive necessary support & training. With the help of the Ministry of Labour & the European Social Fund, the initiative is expanding its digital skills trainings & catering to participants who speak foreign languages, such as Portuguese or Arabic. Digital Inclusion's efforts put digital autonomy within reach of everyone living in Luxembourg. It was recognized as the 2018 National Winner at the Startup Europe Awards Luxembourg in the Social category.

a project by



# ecosystem

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## nurturing a healthy digital habitat.



Back when Luxembourg's ecosystem was more concept than community, Digital Luxembourg set out to bring it to life. Encouraging the development of essential ecosystem infrastructure & policies became our full-time occupation. First on the list was generating opportunities for exchange. Physical spaces & frequent events would allow innovators to connect & share. Next came the creation of dedicated funding channels & crucial resources. Today's thriving ecosystem reflects those early collaborative efforts to establish fertile ground for innovation.

### key objectives

#### — collaboration

*Occasions for connection*

Bringing together entrepreneurs, businesses, researchers & public servants via events & physical spaces

#### — representation

*Innovation's microphone*

Pushing for the resources & support needed to maintain a flourishing ecosystem

#### — marketing

*A visibility boost*

Teaming up with heads of local accelerators to put Luxembourg's ecosystem on the map

#### — funding

*More capital, more opportunity*

Advocating for dedicated funding that gives startups the chance to prove themselves

### areas of interest

#### — startups

*Expedited, simplified creation*

Building a framework of funding, infrastructure & partnerships where success takes on a domino effect

#### — fintech

*A game changer*

Triggering the rise in fintech startups that has redefined financial services

#### — innovation

*The key to better*

Enabling all stakeholders to push the digital envelope & constantly enhance quality of life

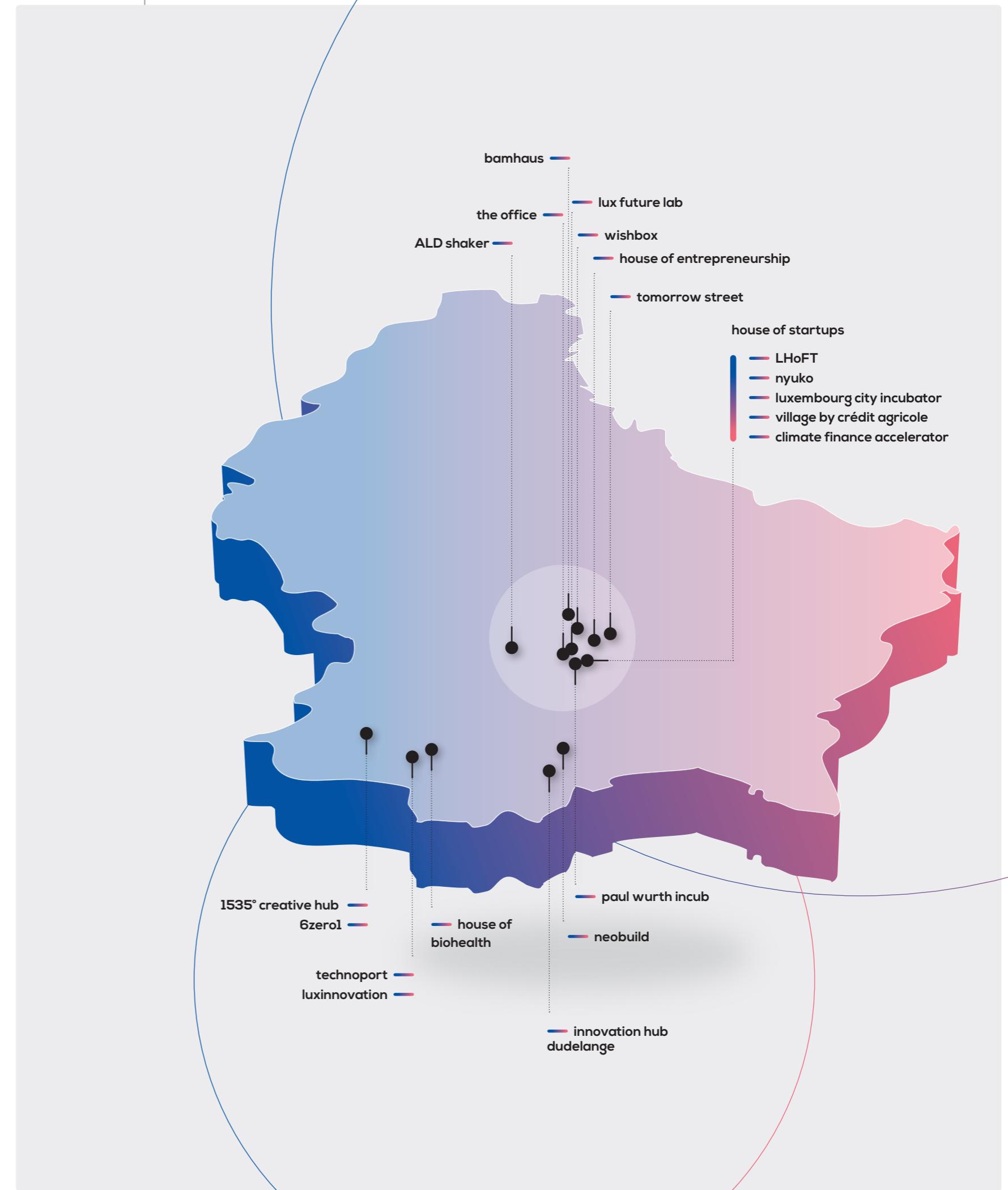
**Let's create a climate  
where innovation is contagious.**

## priorities & initiatives

ecosystem.

# luxembourg's startup ecosystem.

a map of the accelerators,  
incubators & co-working spaces  
dedicated to helping our startups thrive.



# priorities & initiatives

ecosystem.

06

p-36



*our role in the initiative*

## digital tech fund

a stronger startup ecosystem.

The €20.33 million Digital Tech Fund illustrates Luxembourg's unwavering commitment to its digital future. Launched by the Ministry of the Economy, the seed fund supports ICT startups, strengthening the country's ecosystem. A joint public-private partnership & truly a communal effort, the fund received contributions from the government, Société Nationale de Crédit et d'Investissement (SNCI), the University of Luxembourg & many more. The seed fund especially aims to invest in cybersecurity, fintech, big data, digital health, media & next-generation communication networks, digital learning, the internet of things, telecommunications & satellite services. Expon Capital was chosen to manage the fund due to its strong track record in growth-oriented investment management. The Digital Tech Fund will also facilitate the transfer of new technologies from public research, particularly the University of Luxembourg's Interdisciplinary Centre for Security, Reliability & Trust (SnT), to the business world. So far, the fund has invested in two companies: iTravel & Nektria.

a project by



THE GOVERNMENT  
OF THE GRAND DUCHY OF LUXEMBOURG  
Ministry of the Economy

## simplified s.à.r.l.

simple setup, powerful call to action.

One euro & one day is all one person needs to set up a company. In a move to stimulate startup creation, Luxembourg made it possible for virtually anyone with a skill or idea to launch a business. Now, individuals who may have been flirting with the notion have an easy entrance. Without administrative & financial constraints, becoming a startup owner is a day, a euro & an idea away. With the Simplified s.à.r.l., Luxembourg invites its population to start a business. This option, open exclusively to physical persons, aids entrepreneurs without the need for infrastructure or large investments. It separates individual & company assets & excludes the obligation to eventually transition to a standard s.à.r.l. after a set number of years. As more & more people take the plunge into entrepreneurship, Luxembourg's innovative fabric will diversify & strengthen.

a project by



THE GOVERNMENT  
OF THE GRAND DUCHY OF LUXEMBOURG  
Ministry of Justice

## fit4start

opening doors for ICT startups.

Fit4Start takes early-stage startups on a 16-week journey during which they benefit from weekly coaching & follow up by lean startup experts. Additionally, participants gain free access to a co-working space, startup services & a €50,000 grant. Those who successfully complete the program & raise private capital could receive another €100,000. The program specifically targets companies under 12 months old with an innovative ICT project. It is a dangerous world out there for startups. Fit4Start gives young businesses the guidance, tools & resources needed to help make their path to success as smooth as possible. From intensive coaching to valuable networking, participants accepted into the program have an instant edge over the competition. They will test their product, optimize their business model & perfect their pitching skills with the help of dedicated, accomplished mentors. In 2017, more than 220 projects from 21 countries applied & only 10 ICT startups were selected. The program has already helped 14 startups, which have created 41 new jobs & raised over €2.4 million in private funding.

a project by



LUXINNOVATION  
TRUSTED PARTNER FOR BUSINESS

## priorities & initiatives

ecosystem.

06

p-38

### virtual reality



bringing heritage to life.

Digital Luxembourg is embracing virtual reality (VR) as a way to celebrate the country's heritage, establish a VR legacy & expand the possibilities of entertainment. In 2018, the European Year of Cultural Heritage, Digital Luxembourg & the *Service des Sites et Monuments Nationaux* are preserving tradition through new technologies. A mobile VR pavilion will be open to the public at different locations throughout the Grand Duchy, illuminating Vianden's architectural heritage through VR. Yet another example of how digitalization facilitates access, in this case to heritage, Digital Luxembourg hopes for more such applications.

a project by



Service des sites et  
monuments nationaux

### the arrival of VR



virtual becomes a reality in Luxembourg.

With new technologies, exhibitions turn into experiences. Digital Luxembourg & the Film Fund Luxembourg have teamed up to launch a permanent VR pavilion at the Casino Luxembourg. This installation exposes the public to new technologies, stimulates VR content creation & merges art with tech. To bolster this move, VR conferences were a part of the 2018 LuxFilmFestival.

a project by



FILM FUND  
LUXEMBOURG

### LHoFT



putting Luxembourg on the fintech map.

In 2017, the official opening of the Luxembourg House of Financial Technology (LHoFT) symbolized & solidified the importance of fintech in the Grand Duchy. As a global leader in the financial sector, Luxembourg proved to be the perfect home base for fintech startups that are building upon traditional finance. The LHoFT operates as an incubator, providing co-working space for early-stage startups & helping them forge relationships with established financial players. It also organizes events that boost the fintech community (such as masterclasses & hackathons), markets the country abroad, organizes non-mainstream activities, such as sporting events, & works with partners to expand vocational training. Digital investment & portfolio management, blockchain applications, payment solutions, data analytics, artificial intelligence, security & authentication represent some of its areas of emphasis.

a project by



### FNR paypal chair



embracing a fintech identity.

Recognizing the importance of fintech & Luxembourg's unique relationship to it as a financial services hub, PayPal (Europe), the Luxembourg National Research Fund (FNR) & the University of Luxembourg launched a PayPal – FNR PEARL Chair. The aim is to demystify digital technologies & forge connections between regulators, industries & users. The chair will be charged with leading a research team at the University's Interdisciplinary Centre for Security, Reliability & Trust (SnT). With all of the ingredients in place to become a fintech leader, Luxembourg's government seeks to accelerate development by fostering closer collaborations between public & private institutions. Their complementary knowledge bases & functions make them natural counterparts, equipped to answer each other's questions. Combining these diverse perspectives is key to establishing Luxembourg as a fintech center of excellence.

a project by



Fonds National de la  
Recherche Luxembourg



# policy

where law  
& technology  
go hand  
in hand.



What if lawyers & technologists worked side by side? What if regulation spurred innovation? That vision is Digital Luxembourg's blueprint. We draft future-proof legislation & trigger conversations that pave the way for innovation. Let's turn regulation into a vehicle for responsible progress. Today, technology is associated with innovation. Tomorrow, regulation will be too. This era of instant, easy connectivity presents countless opportunities & an equal number of vulnerabilities. Through collaboration, we devise bulletproof processes that protect both people & innovation.

## key objectives

### — modern law

*Timeless legislation*

Drafting future-proof legislation that stands the test of time & keeps Luxembourg a step ahead

### — regtech

*Law & tech in harmony*

Pushing projects & ideas that use technology to facilitate compliance

### — digital access

*Instant answers, a click away*

Unlocking legislation for the public with a smart, open e-portal that removes the middlemen

### — dialogue

*Innovation via conversation*

Assessing global policy trends & triggering necessary conversations within the government

## areas of interest

### — open data

*Public data that's, well...public*

Letting citizens & businesses tap into a wealth of information so that everyone wins

### — data protection

*Your fundamental right to modern privacy*

Keeping your private data as confidential as your private life – balancing security & opportunity

### — e-legislation

*From on paper to online*

Making it easy for citizens to search for laws & find answers with a smart legal database

### — eu policy

*The spirit of Europe*

Fighting for borderless, frictionless data circulation across a Digital Single Market

**We spur digital progress via regulations that always put people first.**

# regulatory rundown.

Decree of  
**may 22  
2015**

lowers the salary threshold for some ICT professions to obtain an EU Blue Card

clarifies the reuse of public sector information

New open data strategy

**may  
2016**

government presents policy of transparency & openness

makes the “Simplified limited liability company” a reality

Bill of Law n°7049  
**aug. 2016**

outlines the processing of personal data

Law of  
**may 23  
2016**

Law of  
**july 23  
2016**

a cloud roadmap for public administration

Cloud strategy  
**dec. 2016**

Law of  
**mar. 8  
2017**

modifies residence permits for highly qualified workers who are third-country nationals, making it easier for students & intra-company transfers to stay & work (& bring their families)

Bill of Law n°7049  
**sept. 2017**

implements the General Data Protection Regulation (GDPR)

the Luxembourgish Press Council & BEE SECURE presented the national “netiquette” for respectful online interactions, endorsed by all local press & media agencies

Guidelines of  
**sept. 25  
2017**

National cybersecurity strategy III  
**jan. 26  
2018**

provides Luxembourg with electronic communication infrastructure that meets international security standards & lays the foundation for a digital society

Law of  
**mar. 16  
2018**

adds flexibility to data storage solutions for financial institutions

Law of  
**feb. 27  
2018**

secures subsidies for the development of online media

# priorities & initiatives

policy.



*our role in the initiative*

## automated meta-data extraction from legal texts (MELT)

[more than laws...answers.](#)

Imagine typing in a personal legal question online & receiving a detailed, intelligent answer based on Luxembourgish law. With the help of the University of Luxembourg, *Service Central de Législation* & others, this will soon be the new norm for an industry that is typically difficult to access. Every individual should be able to find & decipher the laws that govern them & digitalization is making it happen. Digital solutions are simplifying the world left & right. It was only a matter of time before one of the most complex areas – law – was renovated. Integrating meta-text into digital legislation enables smart searches based on colloquial speech. This upgrade analyzes language & converts it into a machine-readable format. Essentially, it turns legal jargon into answers people understand. Once again, digitalization provides administrative transparency & better services to citizens.

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DU GRAND-DUCHÉ DE LUXEMBOURG  
Ministère d'Etat  
Service central de législation



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*our role in the initiative*

## open data regulation

[public data for a better society.](#)



Open data fuels economic growth & innovation by multiplying the applications & value of information. Luxembourg has defined guidelines for the publication & reuse of public data by third parties. Letting the same data contribute to multiple innovations benefits the entire economy. The reuse of public data also builds greater public-sector transparency, simplifies administrative operations, develops new services & pushes the information society forward. When data is shared among different perspectives & industries, one application of that data quickly turns into one hundred.

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Information and Press Service

## free flow of data regulation

[unhindered data, unhindered europeans.](#)



Luxembourg's leadership has long championed for the free flow of data as the essence of a strong, united EU. Ultimately, it seeks to remove restrictions on the circulation of personal or non-personal data that are detrimental. GDPR maintains that personal data must be free flowing, thereby strengthening a borderless Europe. When data moves freely, citizens can move more freely too. By providing enough protection to keep data private & secure without blocking its movement, we take the EU to a new level of unity.

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## priorities & initiatives

policy.

### GDPR



protecting your data.

GDPR – a responsible answer to an increasingly digital world – respects both progress & our fundamental right to privacy. With social media, the internet of things & cloud computing, personal data moves & contributes in ways it has never before. Digital Luxembourg & its partners worked to not only establish GDPR, but make sure that every individual, business & public servant understands its implications. The regulation aims to (1) give ordinary citizens more control over their data, (2) have businesses adopt more responsibility while reducing their administrative workload & (3) reinforce the role of data protection authorities like the CNPD. Citizens who understand their rights & trust their data controllers will more openly embrace the opportunities of digitalization. We want to take the surprises out of GDPR's arrival & make it as easy to understand as possible. Info sessions, conferences & workshops invite stakeholders to learn about the data regulation & what actions are expected of them.

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## CST for GDPR



measuring compliance.

Regulations are only effective if they are applied. After passing GDPR, we want to help companies successfully implement it. A dedicated Compliance Support Tool (CST) helps all stakeholders understand & adhere to GDPR. Tools, resources & information sessions help prepare them to greet this new era in data protection. As GDPR settles into our business & social structure, new questions & solutions will arise. The CNPD & the Luxembourg Institute of Science & Technology (LIST), with the support of Digital Luxembourg, have developed the CST to facilitate roll out. This convenient tool gives companies a glimpse into their level of GDPR compliance & instructions on how to improve their data protection. Users can easily manage documentation & monitor progress. Digital Luxembourg & the CNPD offer events to guide various stakeholders through the GDPR implementation process, so that everyone is ready for its arrival on May 25, 2018.

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LUXEMBOURG  
INSTITUTE OF SCIENCE  
AND TECHNOLOGY  
**LIST**



## priorities & initiatives

government.

# government digital transformation that starts at the top.

Digitalization unlocks a new era in public services for citizens & businesses. The opportunities it brings are transforming the country at every level, including within its government.

New digital tools allow us to simplify procedures, improving both internal efficiency &, consequently, the quality of public services.

Effective digital communication channels create a positive dynamic between ministries & citizens, & among government entities. Modern solutions prevent lengthy follow ups, delays, unnecessary phone calls & redundant paperwork. Our internal digitalization & digital public service priorities result entirely from collaboration. The issues we choose to tackle originate with government entities & citizens.



### key objectives

#### — digital by default

*If it's new, it's digital*

Ensuring that new administrative procedures are 100% digital. No going backwards

#### — only once

*Why be redundant?*

Promoting data sharing between administrations so citizens never have to provide details twice

#### — transparency

*Track your data*

Making systems transparent so that members of the public can see who is using their data & why

#### — single access

*The key to #1-3*

Moving toward digital public services that are all in one place for better administration

### areas of interest

#### — administration

*Digitalizing from the inside out*

Modernizing & improving internal processes with new digital solutions

#### — services

*Simple, streamlined & secure*

Delivering digital public services that make your life easier

**When it comes to public services,  
digital is better.**

# priorities & initiatives

government.



*our role in the initiative*

## digital by default

*if it's new, it's digital.*

As part of the government's principles for implementing effective digital administration, Digital by Default is the start to establishing a new, entirely digital legacy. Along with the Once Only & Transparency principles, this approach aims to digitalize & simplify the administration; increase efficiency of data use so that citizens must only supply it once; & boost transparency of the government's use of data. Since the unveiling of this strategy in 2015, the number of digital administrative procedures has grown. Through online portal MyGuichet, citizens & businesses can complete processes electronically using a secure LuxTrust verification method. This expanded catalogue of digital actions reflects the administration's internal digitalization & its commitment to better public services.

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Government IT Centre

## einfach lëtzebuerg

*strategic, intelligent digitalization.*



Administrative simplification underlies the Einfach Lëtzebuerg action plan. Digitalization, the vehicle for simplification, provides streamlined, transparent solutions that did not exist 10 years ago. The initiative emphasizes the reexamination of existing legislation, quality control, increased transparency & dialogue, & the digitalization of procedures. Vosidee.lu embodies collaborative digitalization for the sake of simplification. Anyone can share their suggestions for national digital solutions. All proposals are considered & a high percentage end up being adopted – for example, a digital application for fishing licenses. Each new project adheres to three principles of administration: Digital by Default (digital from the start); Once Only (sharing of information in the administration's possession); & Open Data (reuse of data by third parties).

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Ministry of the Civil Service and  
Administrative Reform

## data embassy

*powerful ICT partnerships.*



Thanks to its world-leading data centers, steadfast security & advanced infrastructure, Luxembourg will host the first data embassy. Estonia, an advanced IT country – will store valuable, sensitive government information in Luxembourg's data centers. The partnership highlights the collective potential of countries that embrace ICT cooperation. Both governments are committed to investing in the digitalization of their economies & societies. Digitalization in Europe transcends borders, markets & competition. It's a gateway to a stronger, more efficient EU that's truly united & where all member states benefit. When countries sign bilateral ICT partnerships, they are putting their populations first. Luxembourg is committed to exploring the potential of partnerships built on digital cooperation.

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Government IT Centre

## priorities & initiatives

government.



digital dashboard, superior service.

Citizens can securely complete administrative processes online via MyGuichet, an interactive portal that employs LuxTrust certification. E-signatures make entirely digital documents & instant submissions possible. MyGuichet collects forms, documents & personal data in one space, allowing for easy future reuse. In 2017 alone, over 200,000 transactions were completed on the platform. A user-friendly dashboard lets visitors monitor document status, easily switch between different procedures & interact with the administration. Since its creation, roughly 90,500 private accounts & 18,500 professional accounts have been created. In the business eSpace, multiple coworkers can log into the same dashboard. LuxTrust tokens, already owned by many Luxembourgers for banking purposes, digitally authenticate users, opening up a host of verified e-service possibilities. For example, drivers caught speeding by one of the automatic radars can pay their fines online or check the number of points on their driver's licenses. These new possibilities represent the government's intention to improve digital administration.

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## open data



leading the way.

In a few short years Luxembourg moved to the head of the pack in terms of open data. Its open data portal [www.data.public.lu](http://www.data.public.lu), launched in 2016, earned it recognition from the European Data Portal. Its ranking of EU member open data status placed the Grand Duchy sixth on the list. A number of factors contributed to this assessment, including national-level coordination, variety & quality of public datasets, transposition of the corresponding European Directives, & implementation of a national policy. Luxembourg's law implementing the EU directive asserts that public information must be public by nature. Based on that law, the open data portal was born from the Geoportal. The data can be downloaded & used to add value to innovative projects, as part of an app for example. The best illustration of this is Google Maps, who took the data & used it to make Google Maps available in Luxembourg, from which we all benefit.

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# infrastructure

foundation  
for the future.



Infrastructure is like air: easy to forget about but impossible to live without. Pioneering projects need a futuristic foundation. If you can imagine it, Luxembourg's infrastructure can support it. We live at the forefront of connectivity & plan to keep it that way. Society expects instant access to people & information. Grab a mobile & distances disappear. From fiber optics to satellites to 4G technology, Luxembourg's ICT infrastructure will not disappoint. Staying ahead & relevant relies on collaboration with everyone from NGOs to researchers. We focus our resources on technology that fulfills the wishes of citizens & businesses, letting them reach their full potential.

**ICT infrastructure is all about  
access & community.**

## key objectives

### — strategy

*The right path to tomorrow*

Keeping Luxembourg at the front of the pack with smart, responsive infrastructure development

### — trendspotting

*Not up to date, ahead of it*

Giving all segments of society the ICT foundation needed to surpass their goals

### — new business

*A global digital reputation*

Attracting new businesses & investments to Luxembourg with high-quality digital capabilities

### — reporting

*Transparent status updates*

Informing stakeholders about Luxembourg's ultra-high-speed broadband strategy & key news

## areas of interest

### — technology

*Spotting trends & setting them*

Securing the best technology to support optimal infrastructure & cutting-edge solutions

### — connectivity

*Not fast, ultra-high speed*

Delivering lightning-fast access to info, people & services as a leading low-latency hub

### — data centers

*High density, higher quality*

Offering Europe's highest density of TIER IV data centers & setting the standard in data storage

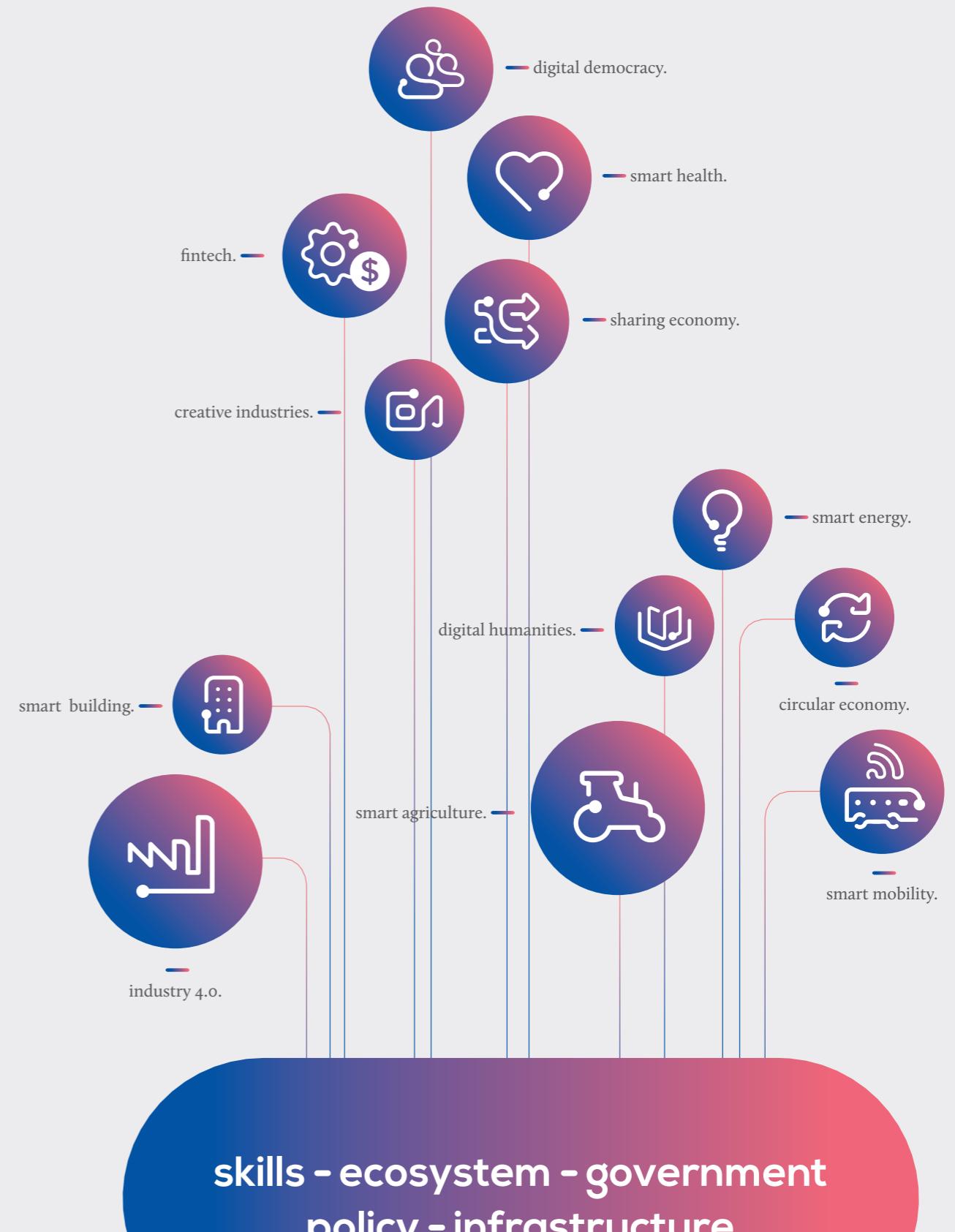
## priorities & initiatives

infrastructure.

06

p-56

# laying the foundation of a smart nation.



# priorities & initiatives

infrastructure.



*our role in the initiative*

## broadband



interconnected, invincible.

Long before fintech & digitalization were mainstream terms, Luxembourg's government began laying the groundwork for a digital economy in which all residents could participate. With fiber & broadband deployment as a priority, Luxembourg focused on becoming the first country with nationwide coverage. With 1,000km of dark fiber, the highest concentration of tier IV & multi-tier data centers, ultra-high bandwidth for four out of five households & leading satellite services, Luxembourg has long been committed to top-notch digital infrastructure. In 2006, it launched LuxConnect, a company charged with improving the country's connectivity by building data centers & a dark fiber market via its own network to serve the country's data centers, industry players & all operators.

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## free wifi



a connected capital.

As the capital of an ever-more digital nation, it is only fitting that Luxembourg City features free, public, high-bandwidth wifi. An ancient city with a digital edge, Luxembourg wants to protect society's right to internet access. By democratizing wifi, it builds public appreciation for digitalization & empowers individuals with limitless information. Free wifi, introduced temporarily at first, garnered enough enthusiasm & support from the public to become a permanent fixture. In its first three months, the number of connections in Luxembourg City & Esch-sur-Alzette totaled a staggering 1.2 million. That is 10,000 daily connections. These numbers spoke for themselves: free, city-wide wifi was in high demand. This digital service impacts inhabitants directly & aligns with Digital Luxembourg's plan to bring the benefits of digitalization to all of society.



## high-performance computer



a competitive digital economy.

In an effort to fortify the digital competitiveness of Luxembourg & Europe, the government signed a European high-performance computer (HPC) cooperation declaration. Known as EuroHPC, the move promises collaboration in setting up an EU-wide HPC network initiated by Luxembourg. By signing the declaration, Luxembourg, Italy, Spain, France, Germany, Portugal & the Netherlands also fortify the Europe 2020 Strategy by helping secure the computing capabilities needed for EU's competitiveness as a digital economy. Luxembourg could soon acquire its own HPC with the power to run at one petaflop per second, corresponding to one-thousand-trillion calculations per second. Aside from the EuroHPC, the University of Luxembourg, Belval, is home to one HPC & a €10-million budget has been allocated to acquiring a new, faster one.

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Ministry of the Economy

## priorities & initiatives

infrastructure.

### 5G rollout



a new level of connectivity.

With the arrival of 4G still fresh in our memory, 5G is already fast approaching. That is the speed of technology. In the spirit of collaboration, Luxembourg's infrastructure team sat down with 5G stakeholders, including the regulator, network providers & tech companies. From there, a 5G taskforce was established to keep Luxembourg at the forefront of connectivity. 5G brings with it a sharp reduction in latency, critical for future breakthroughs, such as autonomous vehicles. Requiring little energy, it also paves the way for the long-awaited internet of things, which will see billions of devices permanently connected to the internet. Testing of 5G technology is underway, but full commercial deployment is unlikely before 2022.

Whenever it arrives, Luxembourg plans to be at the head of the pack. The practical benefits of 5G technology may lie in the future, but securing access to those benefits has already begun.

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Department of Media, Telecommunications  
and Digital Policy

### AI mapping



exploring applications.

Faced with exponential data growth, the world is turning to artificial intelligence (AI) to make sense of & draw value from it. Luxembourg continues to map & consider global trends & local initiatives that use AI to unlock a treasure trove of data. Digital Luxembourg triggers dialogue around AI through seminars on data centers, graphic processing units & machine learning. Exploring AI through the lens of multiple applications accelerates the idea development process. The Grand Duchy follows a holistic approach to digitalization. Defining an AI strategy is central to establishing a digital economy that mines & applies data.

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### infrachain



flexible & secure.

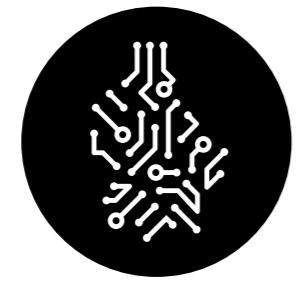
After a show of interest from Luxembourg-based companies, Digital Luxembourg set out to create a blockchain solution that respected regulatory & compliance guidelines. Its goal was to reconcile blockchain technology with the legal environment. Private businesses need the transparent governance of public chains & the flexibility & third-party distribution of private chains. From that conundrum, Infrachain was born. As a non-profit, its blockchains are not owned by anyone. However, users, host operators & Infrachain are still subject to certain agreements. The creation of Infrachain resulted from collaboration between the government & a mix of private actors. It not only strives to address business needs, but also positions Luxembourg as a blockchain competence center that can attract rare blockchain developers. The implications of a common community blockchain-as-a-service platform extend far beyond finance & national borders. Digital Luxembourg wants to build a European network of host operators.

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# let's talk!

your ideas are welcome here.

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