

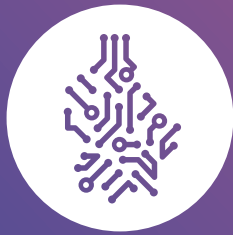
progress report

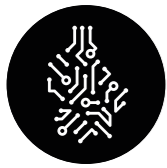
the evolution & the movement.

autumn 2020

digital
luxembourg
innovative initiatives.







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manifesto

what we believe.

the movement, by you

Digital Luxembourg represents the country's digitalization movement. As a communal, uniting force, it brings diverse efforts & actors together in one place.

When a group of people work together to advance a common goal, a movement is born. In Luxembourg, it's the sum of the nation's innovative initiatives all pursuing a simple goal: positive transformation via digitalization.

Whether a student, entrepreneur, organization or anyone living in this modern society, you are part of the movement & Digital Luxembourg is yours.



how to make a movement

— digital luxembourg family recipe

01

identify & prioritize

the topics that bring the greatest positive impact to society.
(We started with skills, policy, ICT ecosystem & government but never stop scanning for what's next.)

02

collaborate

with existing actors in each of those areas. If none exist, kickstart an initiative & ask a relevant team to join forces.

03

work

your way out of a job. Develop that project to maturity. Once it is supported by a competent team, move on.

04

connect

all projects within this field to build a community, e.g. through spaces, events or publications. When you see an ample number of sustainable projects in that field, it's time to move on.

05

pivot

to a new topic that needs your attention.

06

unite

all efforts & all topics under one inclusive brand & cause.

In our case, that's Digital Luxembourg,

the movement.

unifying & strengthening Luxembourg's digitalization movement

In our work, we rarely look backward. Instead, tomorrow gets most of our attention as we collaborate with innovators & organizations, leveling up society's status quo with each project.

But, as we all know, there is value in taking a moment to reflect & celebrate the collective result of individual effort. Luxembourg's transformation is the by-product of long nights spent at the lab, the office or the kitchen table — teams & one-person inventors striving to do things better.

While they might not be aware of it at the time, they are part of something bigger. We call it a movement. It's Digital Luxembourg's job to unify & strengthen that movement however we can. Sometimes that means kickstarting a new initiative until it's mature enough to hand over, or steering conversations & setting the stage for a novel concept to take off. Other times it means reviving a forgotten project or supporting individuals already working toward a mutual goal.

A collaborative government initiative, Digital Luxembourg launched at the end of 2014 to develop the country's digitalization from all angles. At the time, initiatives were few & far between. Those scattered projects have since multiplied, matured & filled an essential purpose in a broader national strategy.

Digital Luxembourg's role is fluid by definition — identifying gaps, acting as necessary, passing the torch & moving on — but the results of this agile approach are very much concrete.

It's impossible to ignore the mushrooming of individual initiatives — from skills to policy — that have combined to transform the country.

But how do you measure a movement?
How do you calculate momentum?

We can say "a lot has happened" over & over again.
But what has happened exactly? How did we get from 2014 Luxembourg with disjointed, little-known projects to a cohesive, bustling movement?

This great leap forward comes with a greater story — one that intertwines Digital Luxembourg's & that of a nation rising to a new calling. But don't be fooled. This isn't a plot line about technology. It's a hero's journey about people.

a word on how we work

Our responsive & collaborative approach makes perfect sense to us here at Digital Luxembourg, but its fluid format can make it tough to define. Our roles come in three main forms.

Digital Luxembourg sticks to a tried & true recipe:

- Identify essential areas to focus on
- Activate strategic initiatives in those areas by facilitating connections & collaborations
- Develop them until they are sustainable
- Hand off the initiative to its original owner or qualified entity
- Repeat the process over again

That's the hallmark of our approach. It's a mouthful, but it works. You'll find it implemented at all levels, from individual initiatives to priority areas to the organization as a whole. In this way, we've gradually patched gaps to cement a movement.



Identify. Activate. **Connect.**
Collaborate. **Develop.**
Hand off. Repeat.

support

To those already active in the field, working toward our shared goal or filling a strategic need, we offer resources & connections that multiply their potential & boost their chances of success.

enable

In areas that lack activity, we kickstart new initiatives, pulling in relevant actors whenever possible — running them until mature & ready to be handed off.

inform

Along the way, we keep the country informed of nationwide efforts to spur engagement & unity. For a movement to exist, the public needs to identify with it!

then & now

how it happened, who it helped

Explosive growth is rarely explosive at all. The reality – methodical, synchronized & unrelenting growth – is admittedly less catchy.

It may seem like Luxembourg became a springboard for innovation overnight, but many minds toiled for countless hours to build it.

After launching in late 2014, Digital Luxembourg's initial priority areas began to emerge:

— **skills**

the right skillsets turn new technologies into professional opportunities

— **ecosystem**

entrepreneurs, researchers & startups merge innovation with action

— **infrastructure**

digitalization's abilities shrink & grow with ICT infrastructure

— **policy**

laws should spur innovation but protect citizens from the risks of data & tech

— **government**

modern citizens deserve a modern administration with quality, digital services

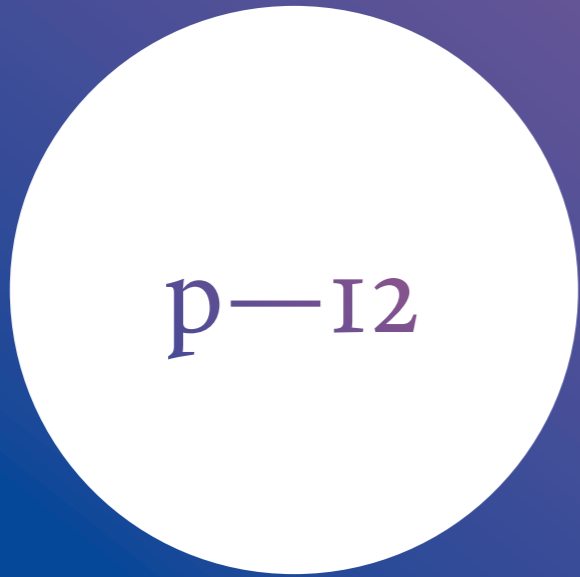


As these areas gained traction & wider support, Digital Luxembourg evolved from a national initiative into a movement.

You'll see that each of our priorities have evolved over the past six years & our roles along with them. **This progress report aims to illustrate those evolutions & shifts.**

countless innovative initiatives,
one meaningful movement.

As digitalization becomes a fixture of virtually every organization, service & industry, its needs will change. We'll continue pursuing positive transformation via digitalization until we've built a fully self-sufficient, inclusive movement that empowers everyone it touches.



p-I2

skills
evolution.

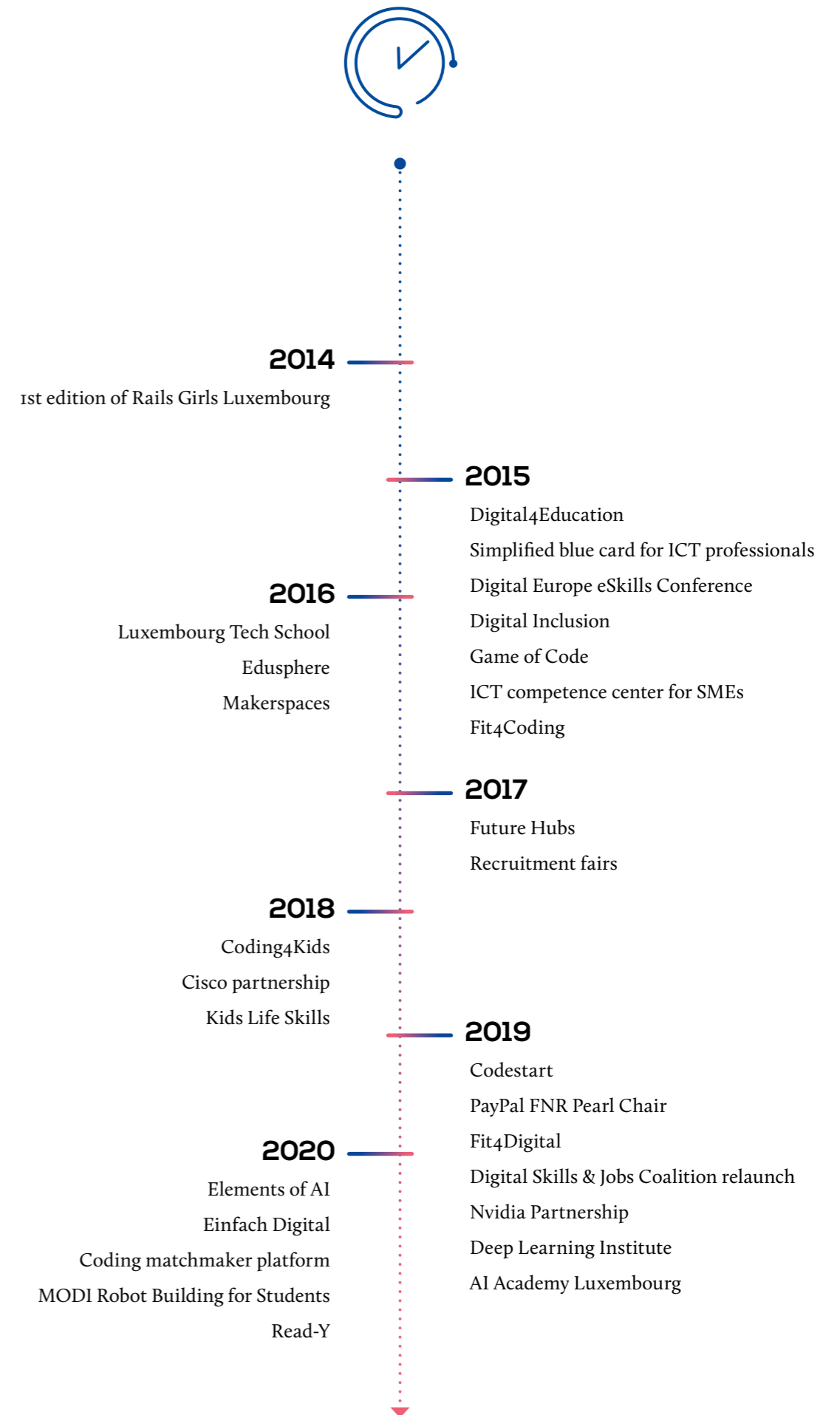
skills

opportunities grow with abilities

Technology moves quickly, expanding job opportunities but also changing them. By equipping today's employees & younger generations with the ability to harness technology, we ensure that digitalization positively affects all of us: children, professionals, businesses & the broader society. That's why the number of skills opportunities in Luxembourg has quadrupled in recent years, as evolving technology & research demanded new types of talent.

Early on, these opportunities appeared primarily as professional trainings. Now, diverse, high-quality courses can be found everywhere – in schools, universities, training centers & businesses – illustrating a growing need. Due to a rise in emerging technologies – AI, 5G, blockchain, etc. – we emphasize advanced digital skills through relevant education & training. A tech-savvy population translates into a digital Luxembourg that can face change with confidence. By focusing our energy on skills, we engage & harness the country's greatest asset: its people.

<i>Then</i>	Handful of trainings for select audiences
<i>Now</i>	Comprehensive, broad collection of trainings for everyone, many now part of the public school curriculum
<i>Up next</i>	Stronger focus on the development of advanced digital skills (AI, Blockchain, etc.)



luxembourg tech school

another year,
another level of creativity

Luxembourg Tech School (LTS) isn't a coding school. Programming represents just one part of a much bigger goal. Its courses teach students how to create & problem solve using technology. While creativity plays a role in all of LTS's modules, it takes centerstage in the Level Up module, AI Creativity & Arts, & the entirely new Level Go.

The program's immensely successful Level One course, launched in 2016 to develop digital leaders, expanded from a single high school to seven & led to the launch of Level Up, a continuation course for graduates.

In 2017, LTS graduated 34 students, and, in 2019, it graduated 115 with no signs of slowing down. While Level One examines game development, big data & fintech,

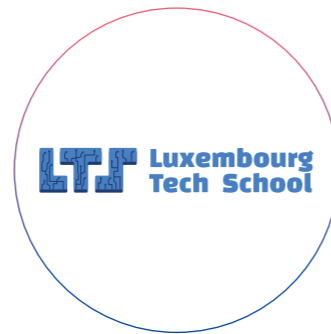
Level Up initially launched with two modules – space resources & AI for finance – before adding AI Creativity & Arts to its ranks last year.

The well-received addition introduces students to generative AI, which revolves around taking data & creating something new using models & tools. Students see firsthand the interplay between people & machines & how the roles can complement each other to produce new works.

Next year, Level Go will join Level One & Level Up, welcoming younger students aged 11-15.

Rather than focusing on future digital leaders, it shapes digital creators via three modules: creative coding, digital thinking & interactive design. Fifty students have already signed up to join the four upcoming cohorts!

a project by



"We give them some information, but then they explore for themselves."

Q&A

sara kaiser
program director & lead coach
luxembourg tech school

Inclusion is important to LTS. What have you done in this regard?

In March, we launched LTS Online. It was an idea before Covid, but suddenly everything had to be done much faster. We had a pilot to test it out & saw that it worked really well. We have students who don't want to travel two hours but want to be a part. That's why one of our Level Go cohorts will also be entirely online. The question is always, "How can we manage to bring LTS to all young people?" We also want to give the chance to students with special needs. This summer we'll start working with the Red Cross to bring creative coding to refugee families. We want to evolve that in Luxembourg with other partners and foundations, too.

How does LTS provide practical preparation to future digital leaders?

We believe in project-based work. They're always learning how to create something with the help

of technology. We give them a broad overview, but they're still able to do something with it. We give them some information, & then they explore for themselves.

Why is it important to differentiate LTS from a coding course?

People think that technology equals coding, but it's just one part. In my opinion, the broader view is much more important, because we won't have 90 percent of kids working as software engineers or programmers. But we will have 90 percent working with digital tools, tech-related tools or technology businesses, so they need a broader view than just the coding aspects.

What is Learning to Work?

We created this a little over a year ago. Students coming out of school were applying for jobs & companies were asking what experience they had. We decided to create side student jobs for them. Through Learning to Work, they can work a few hours

per week on a specific project, usually one that we co-launch with a partner. The financial Game of Life project that came from the CSSF is one example. They wanted our students to work on a gamified financial education app.

LTS throws an impressive number of events every year. Why are events so important?

For every module we try to give students an end goal from the beginning, like a pitching event in front of experts. We see that there's a lot more motivation when there's an end goal, & usually that's an event. Secondly, events help connect us to the industry & let us easily involve them.

spotlight initiatives worth knowing

einfach digital

As the technology scene evolves & matures, so too does Luxembourg's strategy for digital education within its public schools. In 2020, the government presented Einfach Digital, a new national approach to digitalization in the classroom that centers on critical thinking, creativity, communication, collaboration & coding. It represents the next generation of the Ministry of Education's digitalization approach, replacing Digital4Education. Through coding & computer science courses, all of Luxembourg's youth will learn how computers think, putting them in the driver's seat of the 21st century.



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

kids life skills

Who says you need computers to teach computational thinking & coding? Kids Life Skills begins by imparting basic coding concepts & logic to children, ages 4-13 years, using hands-on puzzles & games. From there, the course introduces them to Scratch, a block-based visual programming language for kids, & then makes the leap to Java via kid-friendly, block-based applications. Thanks to growing interest from students & instructors, the program, offered in English, French & Luxembourgish, has steadily expanded.



digital skills opportunities

Digital skills are the bridge between individuals & the digital economy's opportunities. Ready to take the leap into something new, dive deeper into your profession or strengthen your organization? Luxembourg wants to help. Explore our paths forward.

education & youth

getting young minds excited about technology & the careers that await

— einfach digital

Modernization of school curricula to equip students & teachers with the digital & soft skills of the future.

— luxembourg tech school

Program that teaches digital & entrepreneurial skills (e-Leadership) to young people, ages 11-19, via distinct modules that evolve with the market – such as game development, big data, fintech & AI.

— code club

Nonprofit, volunteer-run organization that sparks children's interest in digital creation & coding.

— coding kit

Learning kits distributed by Youth Services to Luxembourg's daycare centers.

— digital skills and jobs coalition luxembourg

Exchange platform for all private and public stakeholders involved in the promotion of digital skills. Led by Digital Luxembourg in cooperation with the Chamber of Commerce and the Chamber of Skilled Crafts.

— student job fair

Yearly fair to inform students & parents about higher education & job opportunities, bolstered by regular awareness raising actions about digital skills & jobs.

— gender4stem

Online learning platform, training & products that help teachers recognize & tackle gender stereotypes in the fields of STEM: Science, Technology, Engineering & Math.

— hack4kids

Course promoting digital literacy & proper online behavior among kids, ages 9-13, using popular multiplayer games.

— cisco networking academy

ICND1 & ICND2 certification courses from Cisco Certified Network Associate Routing & Switching; program also introduces high school students to the field & its opportunities.

— make@on

Themed hackathon events for youth, ages 12-18 organized by Bee Creative.

— codestart

10-day developer training for students who have completed their final high-school exams or for young people over 17 years old; held during Easter & summer holidays.

— future hub

Label for high schools committed to technologies & the innovative learning of sciences, particularly computer science, encouraging the integration of technology in teaching.

— one2one

National iPad Class Deployment Strategy: (1) integrate iPad tools into learning, (2) encourage portable devices in order to develop mobile learning, & (3) bridge infrastructure & awareness of cloud technology issues.

— workshop4me

1.5-hour coding sessions for children to first learn basic concepts & then develop their own projects using drag & drop programming (Scratch or Python).

— girls in ict day

Initiative that encourages young girls to pursue studies & careers in ICT.

— kids life skills

Fun introductory & weekly workshops geared toward teaching kids, ages 4-13, the tech skills they will need for the future.

— jonk entrepreneurs

Camps, workshops & courses that expose young people to entrepreneurship as a viable career path while giving them the skills to take initiative & innovate.

— makerspaces

Spaces for children to experience new technologies, robotics & coding; implemented in several high schools throughout the country as well as in the Forum Gesesseknäppchen (known as Base 1).

— kniwwelino

Visual programming language & library of tested activities designed for primary school children to learn how to program.

ict professionals

attracting & advancing top talent while introducing future generations to the possibilities of ICT

— global game jam

48-hour global game development hackathon that counts Luxembourg among its participating countries.

— fit4digital

Luxinnovation program that helps small businesses generate digital talent & integrate digital technologies, e.g. potential applications of ICT & adoption of new ICT processes.

— cases.lu

Cybersecurity trainings, assessments & services for SMEs & their employees.

— digital plug & work

Networking & recruitment event that brings together Luxembourg's employers & job seekers with tech, finance & legal profiles.

— nvidia ai lab

AI-related courses for Luxembourg's researchers, industry experts & individuals; partnership involves access to resources & expertise.

— women in digital empowerment (wide)

A nonprofit working to ensure that women seize opportunities in the digital economy via coding workshops, leadership programs & events.

labor force

learning opportunities offering a fresh start, advanced skills or anything in between

— ai academy luxembourg

Three training modules respectively geared toward decision makers, technical professionals, data scientists & engineers.

— lifelong-learning.lu

Platform offering trainings for the public in IT, IT language, software & telecommunications.

— inap ai courses

Artificial Intelligence training for public sector decision makers.

— fit4coding

Intensive 3 months programming courses with NumericALL for job seekers registered at ADEM to pursue careers as developers.

— rails girls

Supportive coding workshops for women & girls organized by WIDE.

— game of code

Hackathon that attracts 150 developers of all ages & levels; participants have 24 hours to propose solutions to major societal, environmental, mobility or economic challenges.

— house of training

Tailor-made & customized IT vocational trainings through the Chamber of Commerce & ABBL.

general public

positioning every individual to thrive in a modern society

— science festival

Annual event for students & public that promotes science, research & technology through interactive shows & workshops.

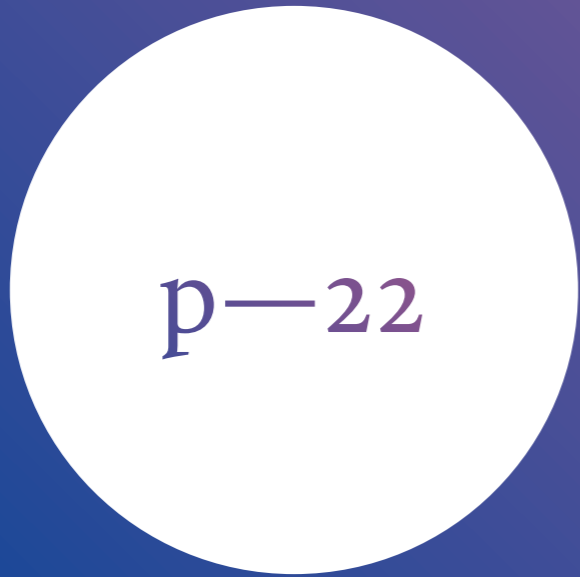
— eu code week

Pan-European initiative supported by the European Commission to encourage all citizens to learn coding.

— makerfest

Workshops for young & old, & a meeting point for basic & secondary classes, youth centers, after-school care programs & families.





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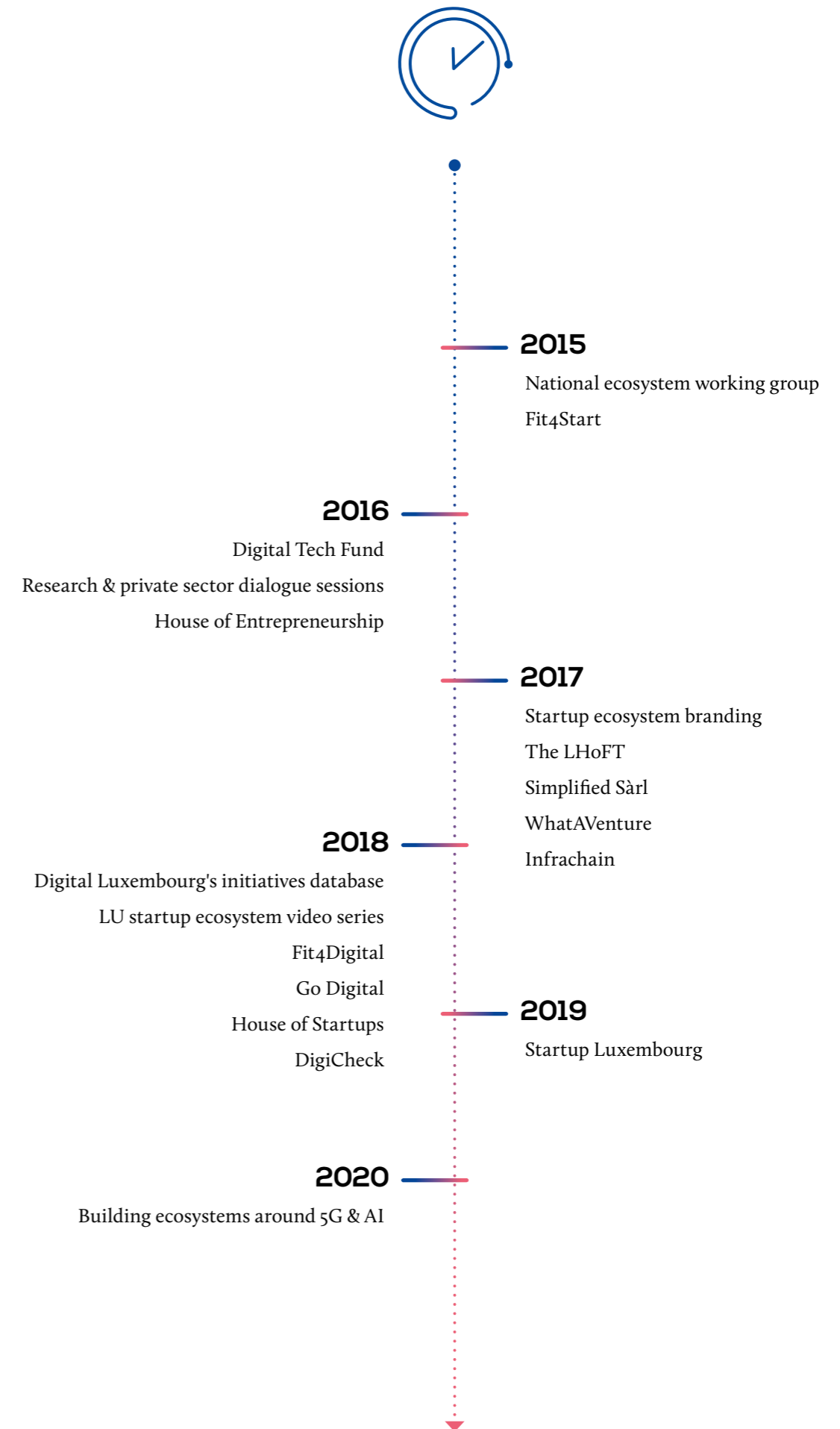
ecosystem
evolution.

ecosystem

a new reputation as a startup hub

Back in 2014, when Luxembourg's ecosystem was more concept than community, Digital Luxembourg set out to build it up & bring it together. We identified a need for spaces to connect, funding channels, support programs &, of course, conversation. Our success came from how we work: repeatedly facilitating dialogue & collaboration between the public, private & research sectors. Bringing together these leaders led to impactful public-private partnerships (Cisco, Nvidia, Paypal, etc.) & key actions. Today, with €20+ million in available seed funding through the Digital Tech Fund & 30+ spaces for innovation, the ecosystem pulses with activity. With sufficient leadership to spearhead its future, from initiatives like Startup Luxembourg, we have slowly reduced our involvement in order to redirect our attention to areas yet to garner interest or reach maturity.

<i>Then</i>	• A limited number of scattered project owners & ideas
<i>Now</i>	• A unified movement with each initiative complementing the whole
<i>Up next</i>	▼ An innovation ecosystem known around the globe



infrachain

weaving a blockchain ecosystem

Infrachain first arrived to address a conundrum facing Luxembourg's business scene. Companies interested in using blockchain technology were drawn to flexible private blockchains rather than the trustless environment of public ones. But private blockchains undermine the beauty of distributed ledger technology (DLT): its transparent, decentralized nature.

Infrachain offers a new combination. It provides trust & accountability through community-driven blockchain governance, reconciling Luxembourg business needs with private blockchains. Although application providers and node operators are independent from each other, they are still subject to certain agreements adopted by the Infrachain community.

Providing community-driven governance for operational blockchains represents just

one of the association's pillars. Its second role goes even further: building a blockchain ecosystem in Luxembourg. Infrachain federates blockchain stakeholders – companies & entities, ranging from tech startups to IT service providers to law firms.

"You wouldn't use a Ferrari to drive down a country road... it's important to know the appropriate applications."

The plan to launch a Blockchain Hub of Excellence embodies that commitment to fueling a robust ecosystem. A joint effort between Infrachain, LëtZBlock, the LHoFT, LIST & the University of Luxembourg's SnT, the initiative

will drive blockchain research & innovation in specific industries; build a blockchain competence community through training & education; & pioneer blockchain governance standards.

To further support dialogue & community, Infrachain has organized three blockchain summits: two in Luxembourg & one in Italy. The next, to be held in Luxembourg will cover operational use cases.

Blockchains are radically collaborative by default, demanding users to surrender a new level of control & privacy. By bringing together Luxembourg's blockchain stakeholders & strengthening the ecosystem's key ingredients, Infrachain is helping blockchain journey safely through the so-called "valley of death" to become the basis of an increasingly digitalised world.

a project by



Q&A

tom kettels project lead infrachain



Why is a robust ecosystem so important?

It has a lot to do with sharing information. In 2017, there was so much hype around blockchain, it impacted the perception of blockchain. Many blockchain projects were started & abandoned because they tried to apply blockchain as a one-size-fits-all solution. That's why we want to share information on what blockchain is, but also on what blockchain is not. Classic database solutions sometimes work better than blockchain-based systems. You wouldn't use a Ferrari to drive down a country road or a an off-road vehicle on a Formula1 track. So, it's important to know the appropriate applications.

What are the ingredients of a successful blockchain ecosystem?

A blockchain ecosystem relies on a handful of ingredients: legal & technical framework, standards & interoperability, & a diverse, representative mix of players.

There's still plenty of work to be done in all areas, particularly in the first two, which are still full of uncertainty (How will the law recognize data authorized in a blockchain? How will different blockchains communicate with one another?)

What else is critical to every blockchain ecosystem?

Ecosystems need a common understanding & state of mind. Distributed ledger technology is about decentralization, about abandoning some power & control. It's not just about the technology, it's a new state of mind.

Which area still requires the most improvement?

Legislation & regulation. The Luxembourg parliament adopted that pioneering securities law last year, but there is room for much more. We need to provide legal certainty, particularly in the financial sector, home to 40 percent of Europe's use cases. The clearer the guidance,

the better it is for the sector. We help with this wherever we can, for example, by drafting a white paper on GDPR or meeting with legislators.

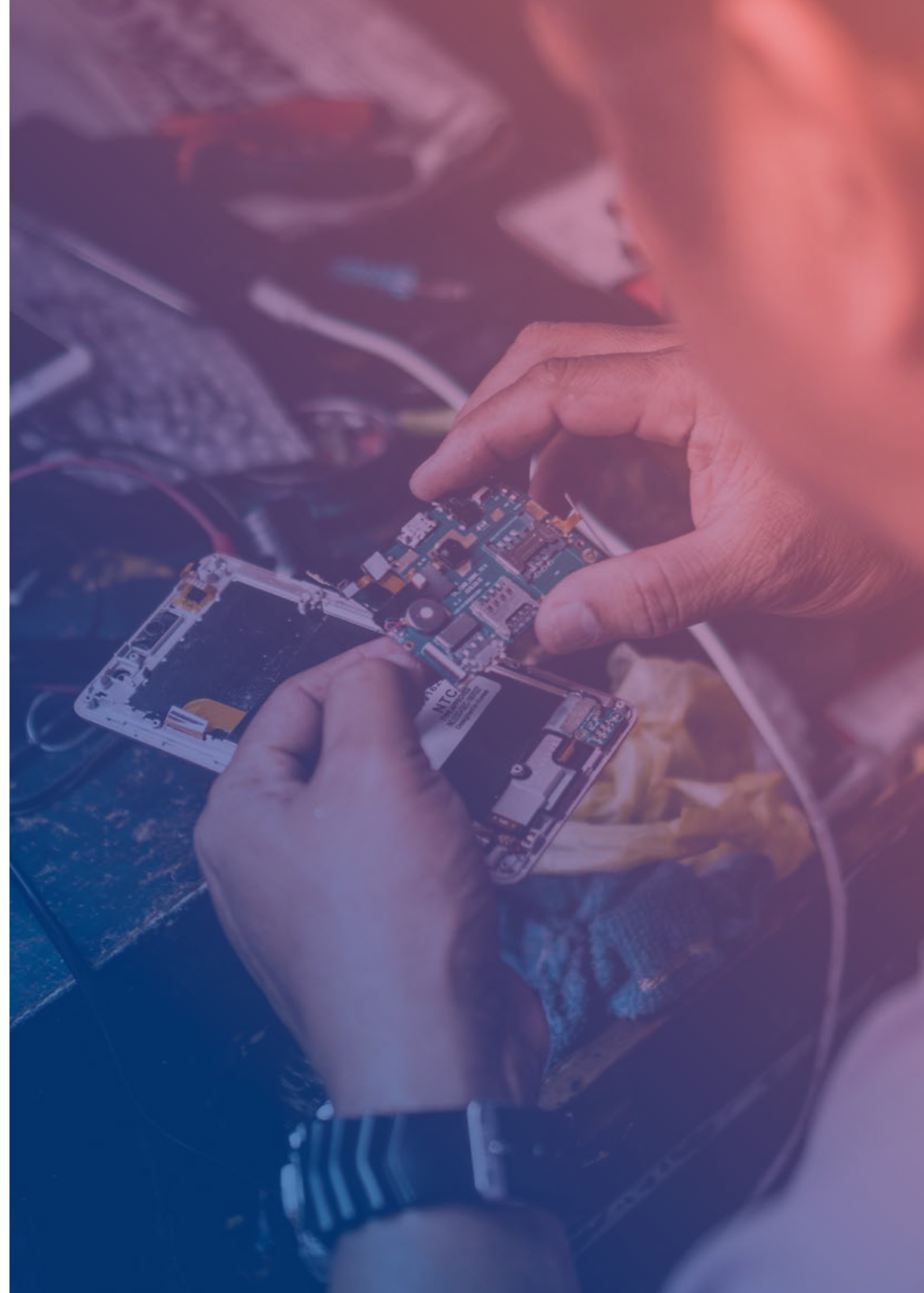
Where does Luxembourg rank in terms of blockchain ecosystem?

Luxembourg is doing very well since the registration & transfer of securities using distributed ledger technology is recognized by law. This is the first clear legal basis in the EU, if not the world. Also, before the summer break, a new draft legislation was presented that, if adopted, will allow the issuance of dematerialised securities using DLT.

spotlight
initiatives worth knowing

nvidia partnership

In 2019, Luxembourg joined forces with Nvidia, announcing a partnership that infuses the local ecosystem with advanced AI & computing resources. Demand for AI technology spans industries, from finance to healthcare. Since its launch, the number of research papers drafted collaboratively by local research institutions & Nvidia has multiplied. Meanwhile, through Nvidia's Deep Learning Institute, more & more professionals have become certified to teach courses to the university & professional communities. Next, Luxembourg wants to focus on strengthening Benelux's AI ecosystem, potentially by expanding the benefits of the virtual Nvidia AI Lab to Belgium & the Netherlands.



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infrastructure
evolution.

infrastructure

connectivity that powers progress

Luxembourg's ICT infrastructure brings technological breakthroughs from the lab into daily life, shaping modern society. With this foundation, organizations can lead the way, pioneering business solutions to better serve global clients. More than a decade ago, Luxembourg started to massively invest in the base layers of its internet infrastructure – at first, by building new fiber connections from the main European capitals to Luxembourg, dropping the latency figures down to nearly zero. Next, the nation developed 50,000 m² of new datacenters & brought dark fiber to all corners of Luxembourg. High-speed broadband has been available throughout the country since 2015.

Together, these investments laid the foundations of Luxembourg as an EU digital infrastructure frontrunner. Firm believers in public-private partnerships, the government has fostered a wide array of collaborations between the nation's research and academic institutions, infrastructure players, global companies & startups. Doing so allows us to boldly pursue what's next: the internet of things & 5G.

Then

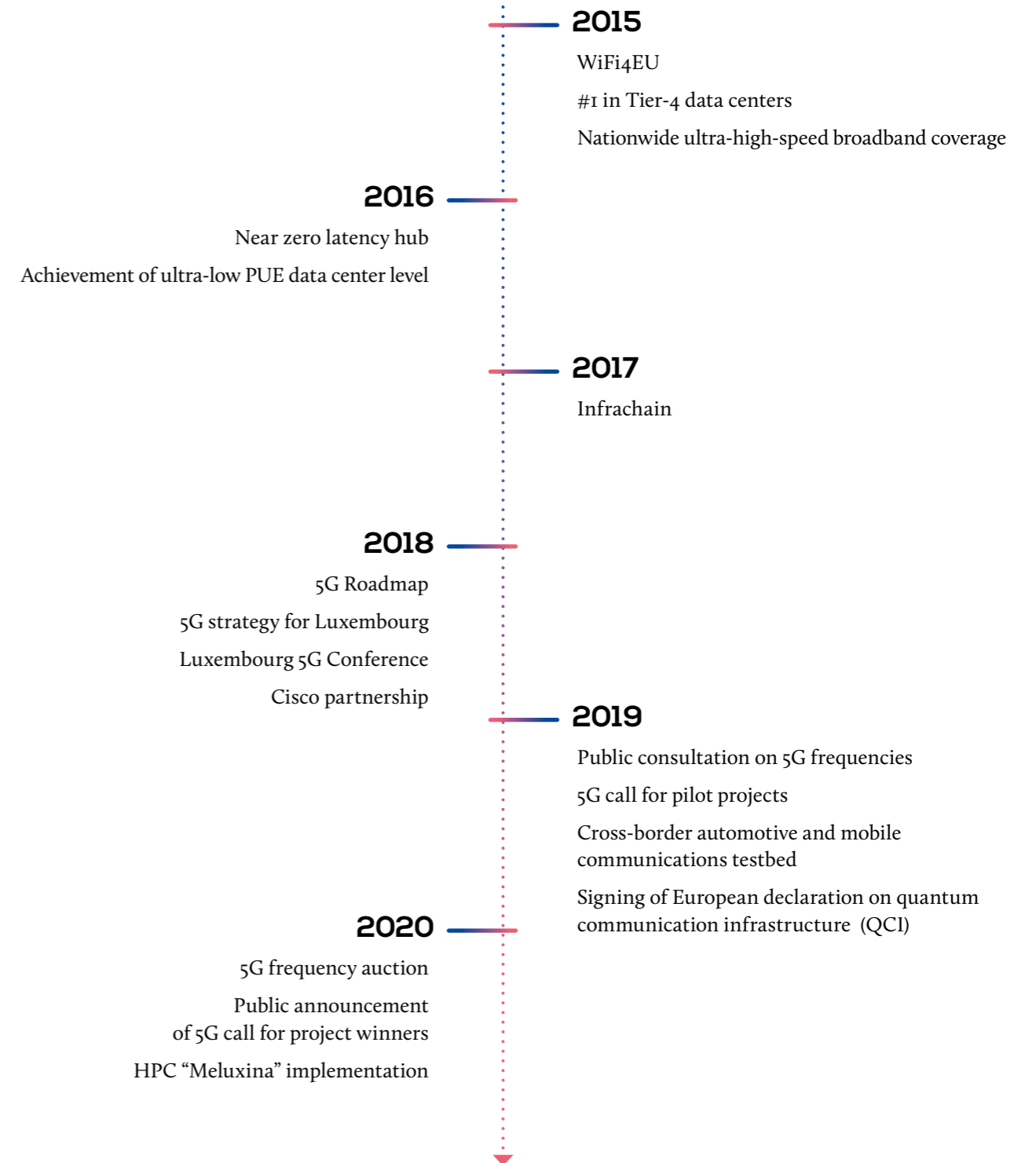
World-class broadband & data centers, fueled by a dedication to ICT & telecoms

Now

Public-private partnerships & exploration of bleeding-edge ICT technology

Up next

Global reputation as a high-quality ICT hub optimal for technology pioneers; strengthening of 5G ecosystem



spotlight
initiatives worth knowing

QCI initiative

In 2019, Luxembourg signed a declaration with six other EU countries (Belgium, Germany, Italy, Malta, the Netherlands & Spain) agreeing to explore the potential for a quantum communication infrastructure (QCI) across Europe. The benefits of QCI boil down to extremely high levels of security, enabled through both earth- & space-based components. Eventually, it would facilitate Europe's quantum internet, connecting quantum computers, for example. Though still in the early stages, participants are working together with the EU Commission to first examine how QCI should be designed in the context of user requirements.



THE GOVERNMENT
OF THE GRAND DUCHY OF LUXEMBOURG
Ministry of State

Department of Media, Telecommunications
and Digital Policy

luxembourg's 5G journey

When the EU Commission published its 5G action plan, the next generation of connectivity quickly went from a years-long topic of discussion to a pan-European deployment priority. In outlining a joint timeline, frequencies, focus areas & rollout strategies, the plan triggered national next steps across the continent. Luxembourg, which had already begun envisioning what 5G success could look like, started exploring how to get there. Early on, the government freed up three essential 5G-compatible frequency bands – 700MHz, 3.6GHz & 26GHz – by working with neighboring Belgium & global satellite operator SES.

To ensure that this new technology would result in more than just faster phones, the Department of Media, Telecommunications & Digital Policy (SMC) interviewed key business verticals to unearth the full potential & practical limitations of ultra-low latency networks & the internet of things. While exploring 5G's benefits, the team looked beyond B2B, acknowledging the "C" ultimately impacted by every business decision – not customers: citizens.

In 2018, after months of development,
Luxembourg announced its national strategy
& set the nation's 5G rollout into motion.

months



2016

sept. 14 **5G action plan**
 EU Commission publishes its vision for 5G in Europe, addressing a joint timeline, frequencies, focus areas & deployment requirements.

aug. - sept **preliminary national public consultation**
 on the use of the frequency band 700MHz to survey the interest of all potential users.

sept. 12 **5G strategy**
 Prime Minister Xavier Bettel presents LU's strategy for introducing 5G networks to the national infrastructure, facilitating the next level of innovation.

nov. 29 **luxembourg 5G conference**
 Large-scale event – organized by the SMC & its partners – brings together citizens and all 5G stakeholder segments to shape LU's next steps through workshops & discussions.

2017

2018

may - july **public consultation on frequencies**
 Session addresses the conditions, modalities & general interest involved with telecoms operators gaining access to the 700MHz & 3.6GHz bands essential to 5G networks.

oct. 18 **electronic communication workshop**
 Public event in Senningen invites businesses & citizens to examine the future of e-communication in the context of 5G.

dec. 3 **government coalition agreement**
 declares the deployment of a nationwide 5G network a government priority.

2019

may - july **national 5G debate**
 Member of Parliament triggers 5G debate resulting in agreement to address all health-related 5G implications while moving forward to secure its social & economic benefits.

oct. 18 **call for 5G projects**
 The SMC launches a call for modern mobile communications projects, inviting organizations to submit innovative proposals centered on 5G technology.

dec. 11 & 12 **luxembourg 5G conference**
 Annual SMC event – with the 2019 theme "Innovation Across Borders" – lets participants select workshops catered to citizens, project leaders & decision makers, or technical experts.

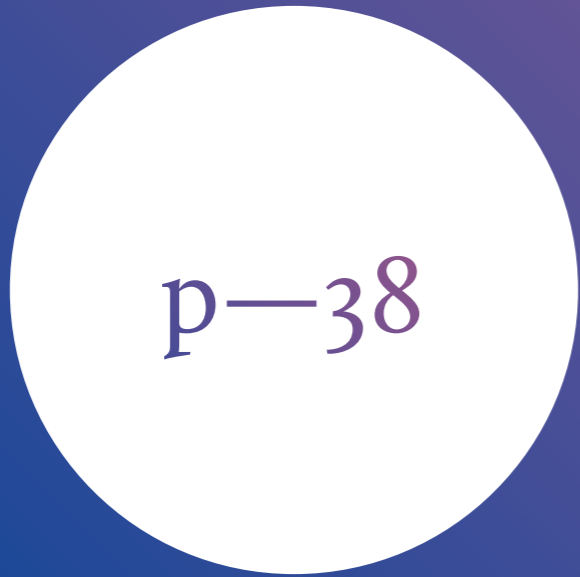
2020

apr. 21 **call for project winners**
 After careful review by an international expert committee in December 2019 and an inter-ministerial committee in February 2020, finalists are chosen & publicly announced.

july 22 **frequency auction results**
 Following its frequency auction, Luxembourg allocates its 700MHz & 3.6GHz bands to 4 operators intending to launch 5G networks.

stay tuned...

2020 has more in store, from a debate on electromagnetic waves to the launch of first 5G projects to a public consultation on the 26GHz band.



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data policy
evolution.

data policy

where law & tech go hand in hand

What if legal experts & technologists worked side by side? What if policy spurred innovation? That vision is Digital Luxembourg's blueprint. We draft future-proof legislation & pave the way for innovation. Today, technology is associated with progress. Tomorrow, innovation will be too. This era of instant, easy connectivity & exponential technologies presents countless opportunities & an equal number of vulnerabilities. Whether working on cybersecurity, data protection or cloud computing, we collaborate to devise bulletproof processes that protect both people & innovation. Our policy team represents LU's priorities in Brussels & implements EU policy decisions back home. As a link between the Grand Duchy & EU policy makers, it triggers dialogue between various stakeholders to establish a national position that benefits the country.

Then

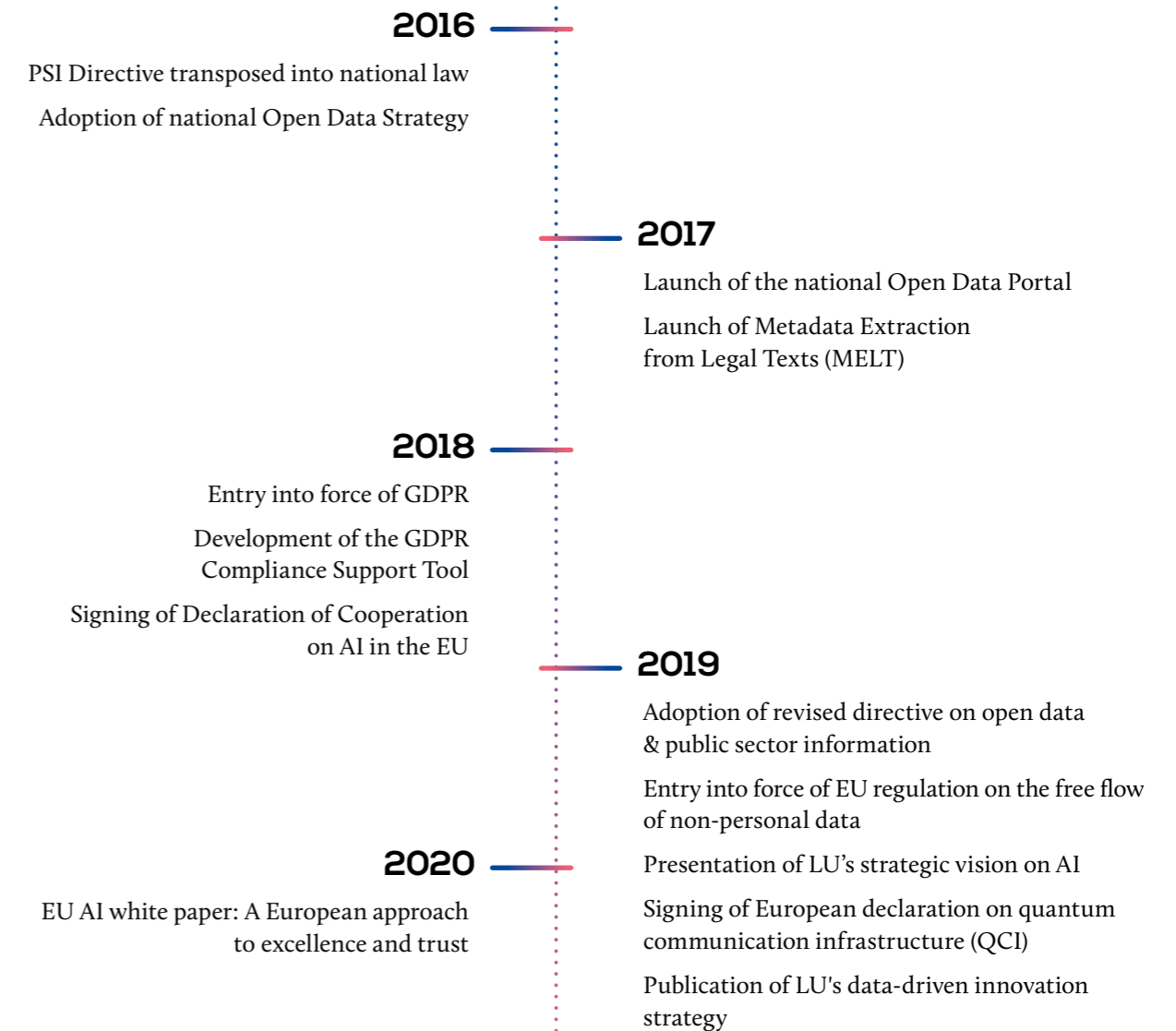
Advocating for one digital Europe & tackling how data would safely flow through it

Now

Sharing LU's vision on how to deepen the digital single market and strengthening European data economy

Up next

Shaping the policy framework for cloud services, platforms and the human-centric development of AI to ensure trustworthy technology and a vibrant data-driven society



regulatory rundown

decree of
may 22

2015

Simplifies market access for some ICT professions to obtain an EU Blue Card

Clarifies the reuse of public sector information

2016

law of
may 23

open data strategy
may

2016

Adopting government policy of transparency & openness

Outlines a cloud roadmap for public administration

2016

cloud strategy
dec.

law of
mar. 22

2017

Cuts the cost of rolling out high-speed broadband

Defines the national “netiquette” for respectful online interactions, endorsed by all local press & media agencies

2017

guidelines of
sept. 25

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

Adds flexibility to data storage solutions for financial institutions

2018

law of
feb. 27

government regulation of
mar. 16

2018

Secures subsidies for the development of online media

Implements the General Data Protection Regulation (GDPR)

2018

law of
aug. 1

law of
may 28

2019

Gives people with disabilities better access to public service websites & mobile apps

- Updated rules on audiovisual media services & video-sharing platforms
- New framework for electronic communications networks & services
- Modernized aid scheme acknowledging media developments
- Revision of law on open data & public sector information

**up
next...**

spotlight
initiatives worth knowing

platform policy

Online platforms— Amazon, Twitter, Facebook, etc. – have expanded exponentially in the last decade, fundamentally changing the way businesses & people interact on the internet. To take this development into account, Europe is revising its legislation that shapes the online world. A cornerstone of the internet, the e-Commerce Directive, is undergoing a major revision with the Digital Services Act, potentially bringing important consequences for platforms. The Audiovisual Media Services Directive, which the policy team is transposing into national law, is a precursor of things to come, placing EU-wide rules on video-sharing platforms. Upcoming platform discussions will address platform liability, redefining platforms' responsibilities when it comes to accountability, due diligence & transparency. Luxembourg is actively involved in current discussions in Brussels to create a level playing field that both fosters innovation & clarifies the roles & duties of all actors involved.



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government

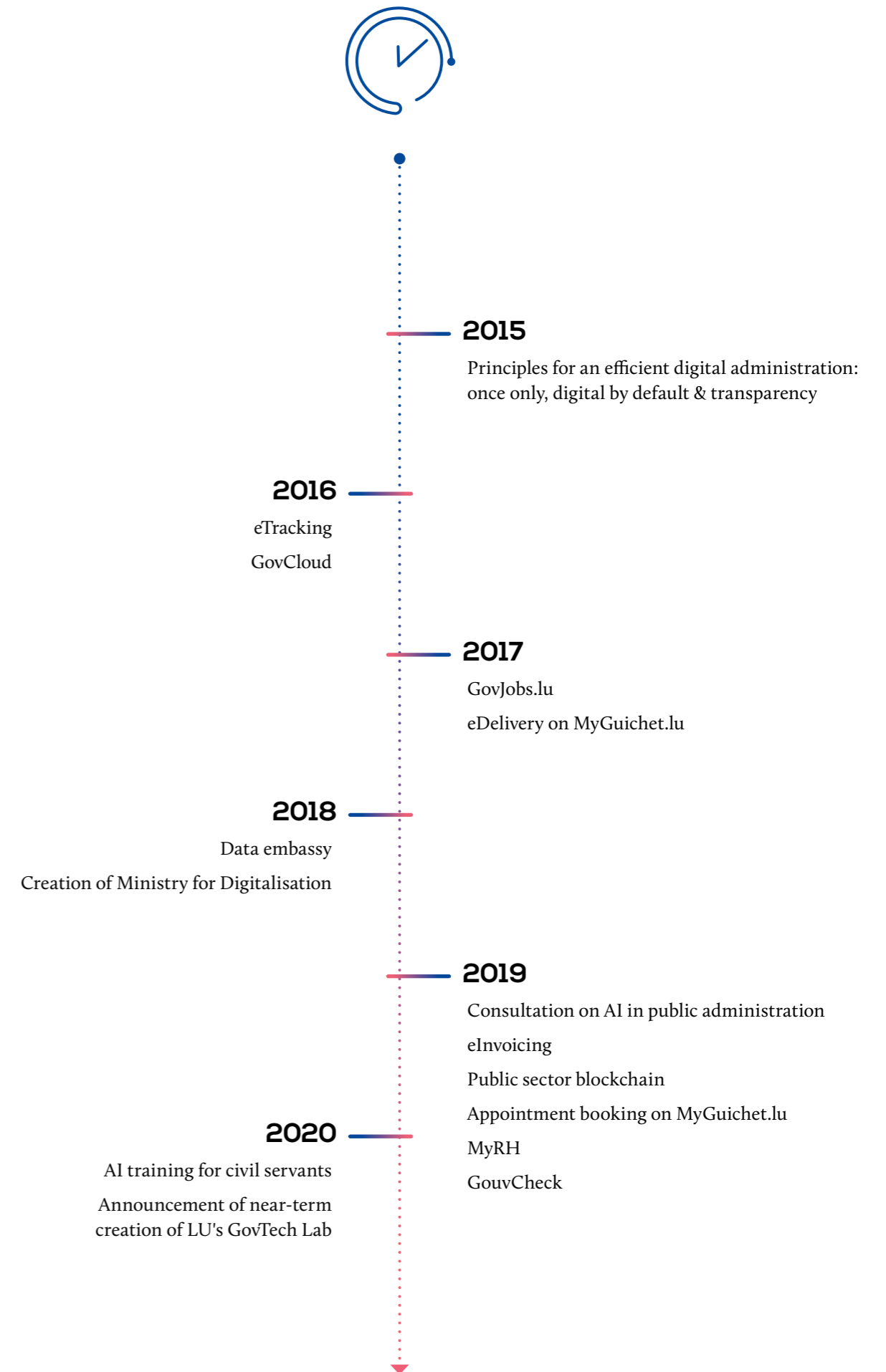
evolution.

government

digitalization from the inside out

Digital solutions simplify & accelerate administrative procedures, benefiting everyone. With each passing year, interactions with the government have become easier & faster. Luxembourg has long pushed forward a digital agenda set on modernizing the administration from the inside out & offering quality digital public services. Effective digital communication channels create a positive dynamic between ministries & citizens. Modern processes prevent lengthy follow ups, delays, unnecessary phone calls & redundant paperwork. Trainings for civil servants (INAP) & the development of online platforms (CTIE), such as Guichet.lu, are a means to that end. MyGuichet.lu, digitizes civil & corporate procedures, lets individuals view any personal data held by the administration & book appointments with relevant public authorities. With the launch of the Ministry for Digitalisation, Luxembourg's dedication to e-administration crystallized, garnering a 99/100 DESI score on Digital Public Services for Businesses.

<i>Then</i>	An array of independent, unconnected physical & digital processes
<i>Now</i>	Digital processes synchronized across government entities that cut redundancies & required resources
<i>Up next</i>	One channel through which citizens can complete any administrative procedure



spotlight initiatives worth knowing

GovJobs

In 2017, the Ministry of the Civil Service launched the GovJobs portal, the cornerstone of its fully digitalized recruitment system. This portal allows you to consult all the job offers or obtain general information on the recruitment process of the public service. You can apply directly for a vacant position or register for the next session of the public service entrance exam (Staatsexamen), pick your preferred slot for taking the exam & take the general aptitude test online. That's right, the applicant eSelection process consists now to a large extent in digitized and normalized aptitude tests covering abstract, verbal or numerical reasoning.



awarded HR digital transformation

In autumn 2018, the State Center for Human Resources and Organisation Management (CGPO) has received the HR Digital Transformation Award by HR One for its all-encompassing fully digitized HR operations management.



MyRH

Digitalization doesn't end at the public service's recruitment process. Once you're on board, you can use the MyRH employee self-service portal to access all kinds of information and services related to human resources management. Via MyRH you can, for example, consult and download your remuneration sheets or training account statement or apply for a family allowance or pension estimate. It's that simple.



digital academy

Three years ago, Luxembourg's National Institute for Public Administration set out to develop innovative trainings & resources for public servants, resulting in the Digital Academy. In spring of 2020, 27 individuals successfully participated in the first full digital initial training. Digital trainings mean greater flexibility and inclusive learning opportunities for government employees.



GouvCheck

The GouvCheck app allows you verify, in real time and for free, the authenticity of official documents issued by an administrative body in Luxembourg. If the document holds a QR code, which many of the official documents in Luxembourg do, the app allows you to check its authenticity (legal value) & its integrity (correctness of information provided). All you need to do is download the app and get started, no internet connection required.



evolution

then & now.

appointment booking on MyGuichet.lu

Accessible through Guichet.lu, MyGuichet.lu offers a single space for a wide range of online services provided by the Luxembourg government. The platform, which is a household name in Luxembourg, provides private individual and business users access to a host of administrative formalities and procedures. Users can fill in forms online, sign them electronically, attach any required supporting documents & submit them to the relevant administrative authorities. But that's not all! On MyGuichet.lu you can also view some of your personal data held by the Luxembourg authorities, check the data & correct it if necessary, or receive official documents (eDelivery) from your 100% secure personal space. Digital & user-friendly, MyGuichet.lu has proven invaluable during the coronavirus crisis, allowing affected businesses to directly apply for financial support. Additionally, citizens have been able to book appointments with public administrations via the platform. Whether you'd like to schedule a Covid19 test at an official testing facility, apply for & pick up your identity card or make an appointment with the National Health Fund (CNS), it all happens online via MyGuichet.lu.



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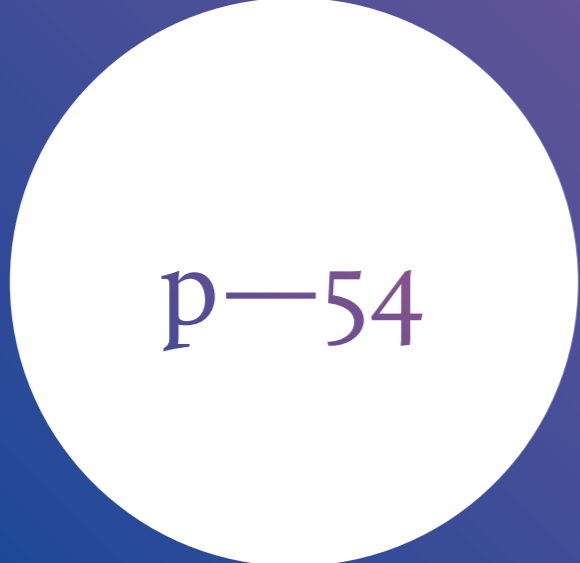
public sector blockchain

In spring 2019, the Ministry for Digitalisation, in collaboration with CTIE and SIGI, announced the creation of the first blockchain in the public sector. This technology will help improve the transparency, reliability & security of public sector information systems & digital processes. With this project, the government displays its ambition to play a pioneering role in the field of blockchain, convinced that if the state makes significant advances in digitization and the use of new technologies, companies will be encouraged to do so, too.



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what's next

today & tomorrow.

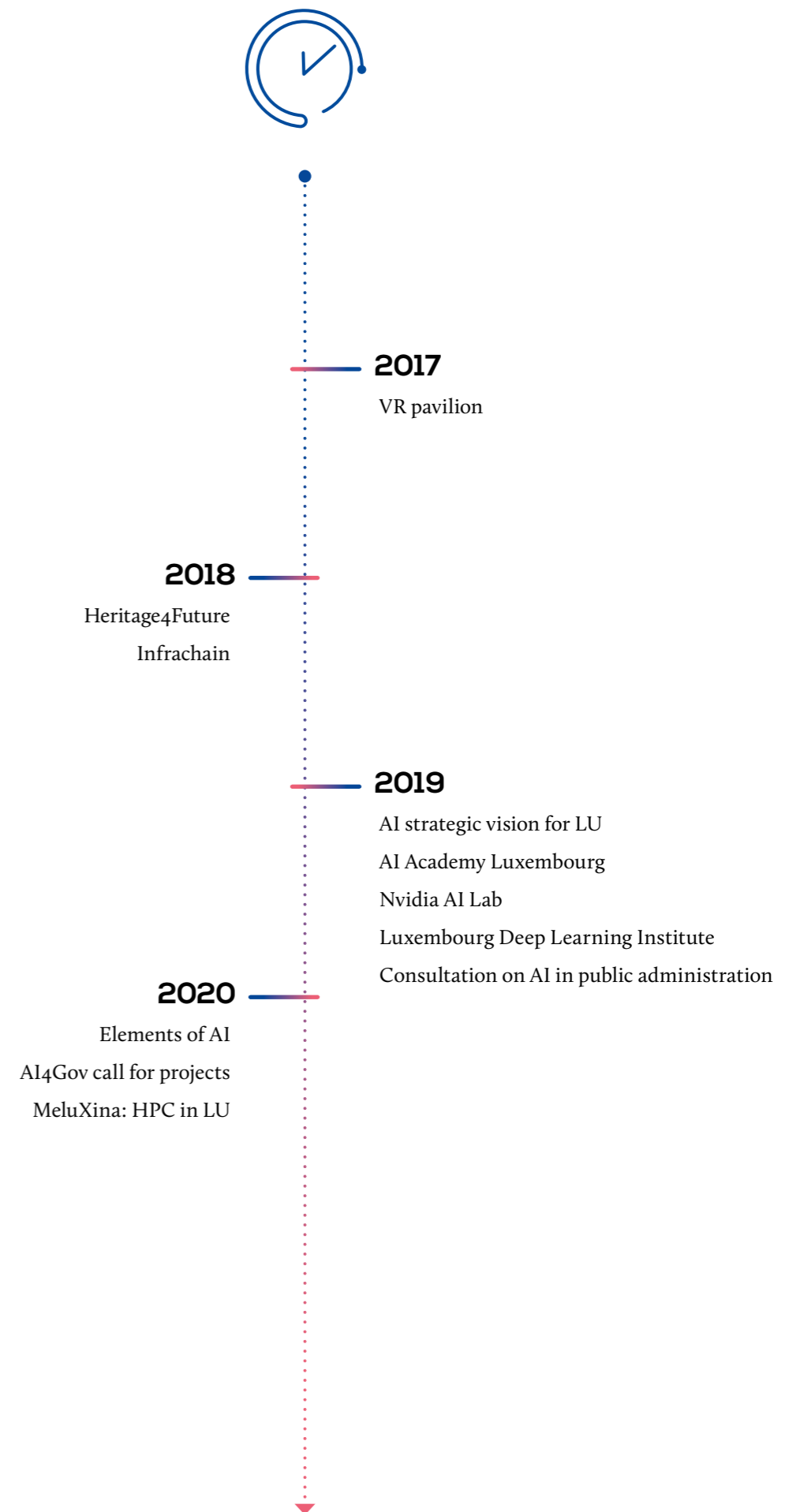
new tech

pushing the edge of possible

Remember back in 2014, before fintech turned from trendy compound word to living, breathing ecosystem? Through spaces & expertise (e.g. the Luxembourg House of Financial Technology), events, support programs & funding (e.g. the Digital Tech Fund), that budding field became a buzzing community. The larger ecosystem underwent a similar transformation & we want that same success for new technologies - primarily AI, VR & blockchain. Take AI: A cutting-edge technology with vast, untapped potential that draws value from big data. Its speed & automation will touch healthcare, governance, education, transportation & beyond.

The formula that worked with fintech
won't necessarily work with new tech,
so we're approaching it with fresh eyes.

<i>Then</i>	Identifying key technologies
<i>Now</i>	Enabling & supporting new technology initiatives
<i>Up next</i>	Building ecosystems around individual technologies



AI4Gov call for projects

a lesson in tech procurement

Implementing AI to improve public services sounds enticing, but where exactly does an administration even begin?

As governments become more digital, public servants will be called to regularly identify, procure & integrate new tech. Luxembourg's call for AI projects helps its ministries kickstart the adoption of AI solutions. More importantly, it gives public servants the firsthand experience needed to master the process of procuring advanced technology – a skillset that will only become more critical with time.

In November 2019, the Department of Media, Telecommunications & Digital Policy (SMC), along with the Ministry for Digitalisation, & the Information & Press Service launched a call for public projects. Ministries were invited to submit ideas for AI-based initiatives that would help them optimize or expand their services.

“The goal here was to give public servants hands-on experience in the procurement & implementation of AI based technology.”

The call drew a total of 14 projects from seven different administrations. An external selection committee of experts selected six winning ideas that were feasible & widely beneficial. Each chosen team receives funds to kickstart its project along with guidance on how to move forward through the procurement process, design & service provider selection.

Once the projects start, regular meetings bring together project owners to share their insights

& lessons learned, gradually building a community around AI.

Over the course of six to nine months, the selected service provider & the administration will work side by side to develop their project. At the end of that period, a completed proof of concept & mock-up will help determine if the project should move forward. This learning experience brings lasting value to Luxembourg's public administration.



Q&A

max gindt
policy advisor

department of media, telecommunications & digital policy

How does this initiative strengthen Luxembourg?

The goal here was to give public servants hands-on experience in the procurement & implementation of AI based technology. This has the potential to reduce the cost of procurement for IT services, because if you know what you want & what you can get, then you'll always end up with something more efficient. AI-based technologies can get pretty complicated. We want to create expertise inside the team & focus on the administration as an innovator.

What surprised you most about this call for AI projects?

I was surprised by the number of good, mature ideas that were waiting & ready to go within the administrations. They had clearly already done a lot of thinking about how they could use AI technology to better serve their clients. It was just a matter of taking that next step.

Can you give us an example of one of the projects?

Yes, the Luxembourg National Library (BNL) wants to leverage AI technology to make documents more accessible to researchers. There are currently massive amounts of info available but it's labor intensive to unlock. We have a big research community here in Luxembourg, so this would be immensely helpful to them.

What's most exciting about this initiative?

The technology is of course exciting, but the more interesting thing is being able to work with agile teams from other administrations that I didn't know about yet. We can get into group discussions with people coming from completely different communities inside the state. That kind of cooperation benefits everyone.

what's next

today & tomorrow.

spotlight initiatives worth knowing

elements of ai

The free & highly acclaimed Elements of AI course is scheduled to officially arrive in Luxembourg. An online series that originated in Finland, the program, available in all official EU languages, is on a mission to demystify AI. It delivers complex subject matter in a digestible format for those with nontechnical backgrounds. The National Institute of Public Administration (INAP), the University of Luxembourg, SCRIPT & Digital Luxembourg are working together to ensure that completion of the course earns the participant an official certification & course credits.



ai ethics committee

Artificial intelligence poses both liberating solutions & troublesome dilemmas. Rather than waiting for new technology to raise moral and legal questions, Luxembourg plans to stay ahead of the risks by starting the conversation now. The seed for Luxembourg's AI Legal and Ethics Committee has taken shape as a team of legal experts on data and technology set up to evaluate the finalists in the national AI4Gov call for projects. This committee will grow, diversify, encourage dialogue & ask the tough questions related to life-changing technologies.



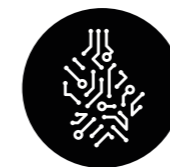
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We believe that change is inevitable, but progress is earned. That without purpose, innovation is just work. We believe in people, young & old. That digitalization is happening for them & that society will be shaped by them. We see technology as creative expression; innovation as a love affair with the unknown. We know that time is the most valuable commodity. That the future is a byproduct of the present. That our choices today define our world tomorrow. We fight for diversity. More points of view mean fewer blind spots. We've learned that collaboration is always worth it. That an expert mind is fine, but a beginner's mind is gold. We believe in the power of a common mission, in sharing resources, jokes, time, energy & advice.

We revel in fresh starts & reinvention, reevaluating daily, reinventing monthly, filling gaps like it's our job. Because it is. We view failures as stepping stones, not missteps. We believe the WHY matters more than the WHAT. That by doing good we can live well. That technology is here to serve all of us, translating ideas into reality. We believe that questions rule. Growth hurts. Problems are invitations. Perfection is a fool's errand & learning never ends. We believe in Europe. In open borders, open minds & open data. In opening doors & broadening conversations.



We believe in you.

We wouldn't be here if we didn't.



disclaimer

This Progress Report is prepared by a dedicated team at the Ministry of State's Department for Media, Telecommunications & Digital Policy (SMC), which runs the Digital Luxembourg initiative.

The aim of this report is to provide you with an overview of what has happened since the launch of Digital Luxembourg. As a communal, uniting force, Digital Luxembourg brings diverse efforts & actors together in one place. To faithfully represent what has happened, we collect information from various sources and partners.

While all information in this Progress Report is provided in good faith, we make no warranty of any kind regarding the accuracy or completeness of the information provided in this brochure.

let's talk!

your ideas are welcome here.

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