AI 4
BELGIUM

PREFACE

Everyone wants to get ahead. You do, your neighbour does and so do we. The need for social and economic progress is an integral part of the human condition. It is the common denominator that unites students, workers, pensioners and business leaders alike.

We all want better and affordable healthcare, solutions for climate change, more job opportunities, better purchasing power and even mundane things, like spending less time in traffic. We want our quality of life and that of our children to improve. Curiosity, innovation and developing new skills have always been our strengths. So, let's put them to good use.

We live in exciting times. We believe a key force behind social progress can be technological progress, of which Artificial Intelligence (AI) is now one of the principal drivers. AI can help us to anticipate diseases, cut energy consumption, transform tedious jobs into exciting ones, decrease the cost of many products and better manage our traffic. But more importantly, this technology can set us free, granting us more time for the things that define our humanness, like family and creativity, or - simply put - the pursuit of happiness.

If we want to reap the benefits of AI, however, much work is yet to be done. For decades, our country has been a pioneer in this, and many other fields. That knowledge and energy is still around. But while many countries are already making significant investments, we are

at risk of falling behind. It is time to be bold and ambitious, to come together, all of us, and to prepare our country for a future that is inevitably digital. We need to scale up local initiatives and put Belgium firmly on the map internationally. That's why we are creating the AI 4 Belgium coalition; to incite our country to seize this opportunity with both hands. This is a coalition open to anyone who wants to build a better Belgium.

We are proud that the first members of this coalition are among the leading Belgians active in AI. This is a multidisciplinary team, covering a wide political spectrum and multiple backgrounds. Yet despite its divergency, this team has come together and has proposed a concerted AI program for all levels of government and different stakeholders. The fact that they have achieved such a level of agreement on the required actions is all the more proof that action is needed and is needed now.

This is an initial step towards an ambitious and official Belgian AI strategy. We will start implementing some of the coalition's recommendations. It will also be up to our next government to uphold this ambition and put recommendations into practice, together.

Alexander De Croo & Philippe De Backer

Ministers for Digital Agenda, Belgium
Alexander De Croo & Philippe De Backer

INTRODUCTION

You are using artificial intelligence (AI) right now: in your pocket, on your computer, even when you shop. Just think of your smartphone, telling you to leave for your next appointment because of traffic congestion, or of the translation tools we use when travelling. Think of the suggested TV-series when you scroll through your Netflix-account.

And this is just the start! The ways in which AI can change our lives for the better, reach beyond our wildest dreams. Thanks to AI, doctors are better equipped to predict and identify brain tumours. Restaurants can reduce waste by predicting customers' orders. Deaf children can follow classes with their peers through speech-to-text conversion. Your family home or a manufacturing company can cut down its energy consumption through better temperature control. Companies can develop more efficient renewable energy technology.

And self-driving vehicles can decrease traffic casualties and traffic jams or, indeed, simply free up more time for us.

We are leaders from academia, start-ups, corporations, technology firms and public institutions. We are diverse in age, background, political preference or convictions about AI. All of us believe it is time for our country to take up its responsibilities and capture the opportunities of technology and AI. It can improve our lives, can boost our economy's productivity, is already changing our job market rapidly and we want to be the architects of our own future. Also, other countries are already advancing rapidly.

The Minister of Digital Agenda has asked us to come together, in a single, common initiative, to share recommendations for our country to act. We have interacted with over 100 individuals, from within or outside the AI space, to develop our conclusions. The whole ecosystem is sending us a clear message: we all believe major action is required in Belgium to ensure that AI becomes a positive force for Belgium. We can be at the European top. But it won't happen by accident. This coalition is bound to grow; this is also a call for unity and collaboration.

Belgians have always been at the forefront when it comes to technology and AI. Just think of Robert Cailliau, who invented the web with Sir Tim Berners-Lee. Belgians are leading AI development at Open AI, MIT, Deepmind or the decentralised internet. Other Belgian academics are part of the global top. In fact, Belgians have always played an important role in AI, but our country as a whole has failed to follow suit.

Indeed, we believe Belgium needs to make more of an effort to develop the necessary skills and prepare for a labour market transformation.

AI 4Belgium Coalition

Ann Nowé, VUB
Bart De Smet, Georges Theys, Ageas
Bruno Schröder & Lorelien Hoet, Microsoft
Erik Mannens & Tom Dhaene, UGent
Fons Leroy & Guido Van Humbeek, VDAB
Frank Robben, Sociale Zekerheid
Frédéric Pivetta, Dalberg Data Insights
Gregory Renard, xBrain
Hans D'hondt & Michel Van Hoegaerden, FPS Finances

Moreover, the country needs a proper data strategy and ethical principles to support AI development, deployment and use. Citizens and companies are not sufficiently reaping the benefits of the ongoing technological evolutions. Universities and start-ups lack the means to scale up and the tools to permeate throughout the world. And finally, our public institutions are not always acting as accelerators of innovation, but rather as bottlenecks.

While many European countries now have an AI-focused strategy, Belgium does not yet. Having said that, multiple initiatives are now underway. Flanders has launched its AI strategy, planning to spend an annual EUR 30m on implementing AI in companies, top strategic research and flanking measures such as education, outreach and ethics. Wallonia and Brussels have digital strategies and multiple local initiatives, including AI meetups or the Walloon Réseau IA. Multiple tech, data or digital hubs have also shot up in recent years. Examples are DigitYser, The Beacon and BeCentral. The Federal Parliament workgroup on robotics and digital agenda is building recommendations. Moreover, the Investment Pact, proposed by the Prime Minister, identified close to EUR 30 billion worth of investments in the digital transformation. Lastly, we already have multiple universities, companies, start-ups, and other organisations actively developing or exploring AI.

We believe these initiatives are ambitious and hit the right notes. We propose to build on these and come together. We need to involve all government-level institutions in this transition, and we need a strong Belgian story to share with the outside world, starting with Europe. We also need to set a national financial ambition level.

Hugues Bersini & Tom Lenaerts, ULB
Jo De Boeck & Rudy Lauwereins, IMEC
Joseph Fattouch, Cabinet Digital Agenda
Jonathan Berte, Robovision
Karim Benseghir, FPS Economie
Koen Debackere & Luc Van Gool, KU Leuven
Laurent Hublet, BeCentral
Marc Lambotte & Ferdinand Casier, Agoria
Marc Raisière & Patrick Devis, Belfius
Mieke De Ketelaere, SAS
Nicolas Deruytter & Julie Scherpenseel, ML6
Omar Mohout, Sirris
Pascal Coppens, nexxworks
Pattie Maes, MIT
Philippe Dubernard & Wouter Denayer, IBM
Pierre Rion, Conseil Numérique Wallon
Pieter De Leenheer, Collibra
Stef Heylen & Bart Vannieuwenhuyse, Janssen
Thierry Geerts, Google
Yves Deville, UCLouvain

FAQ

When did AI develop?

The term artificial intelligence goes back more than 60 years, to the Dartmouth Conference in 1956. But it is only in the last decade that the industrial potential of AI has been recognised. The main reason is that there has never been more data available, more affordable computing power, or better open-sourced algorithms and technology.

What is AI?

According to the European Commission: "AI refers to systems that display intelligent behaviour by analysing their environment and taking actions – with some degree of autonomy – to achieve specific goals. AI-based systems can be purely software-based, acting in the virtual world (e.g. voice assistants, image analysis software, search engines, speech and face recognition systems) or AI can be embedded in hardware devices (e.g. advanced robots, autonomous cars, drones or Internet of Things applications)."

What does AI do?

This depends on the input used and the output desired. The data that is being used can vary greatly. Ranging from an image, to a sound clip or a credit card purchase. The output depends on the question asked. What exactly is said in the sound clip? Is the purchase fraudulent? How many elephants are in that image? Nonetheless, the current AI applications only work in clearly defined separate domains and are not capable of general human intelligence or common sense. A chess robot cannot engage in face recognition, an algorithm that detects credit card fraud cannot win a chess match. Yet, often, similar design rules can be used to build both systems.

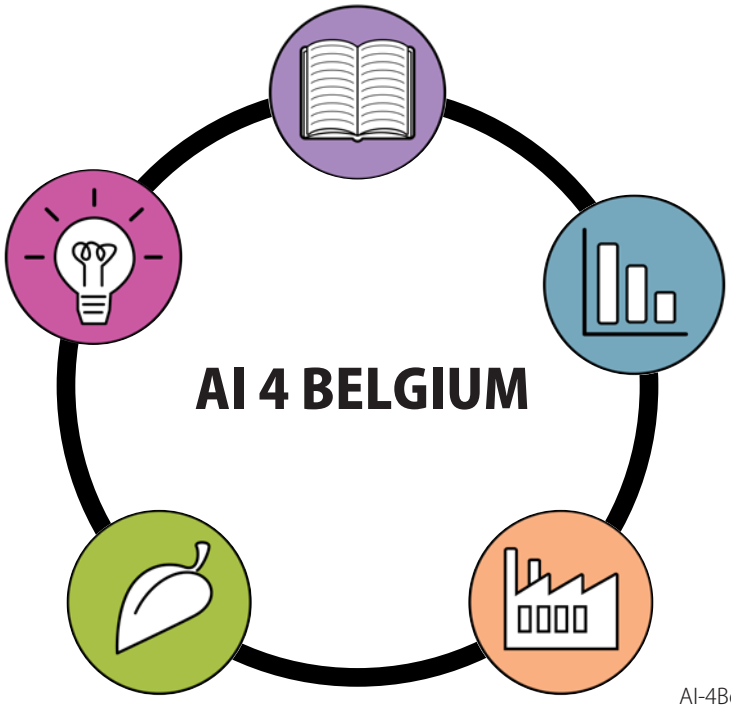
OBJECTIVES OF THIS DOCUMENT

01 Put artificial intelligence and its implications at the top of the Belgian (federal and regional) political agenda. In more concrete terms, urge the political leaders to make AI and its implications one of the top priorities of the next government, complementing ongoing initiatives

02 Inspire the public debate on the required actions to undertake. Support the public to understand the implications of AI and its importance on their own and their children's lives

03 Encourage the development and deployment of human-centred AI

04 Provide a first version of an overarching Belgian Artificial Intelligence Strategy by aligning all stakeholders in the wider ecosystem



SUMMARY OF RECOMMENDATIONS

We have world-class assets that need to be nurtured and developed. And with the right level of ambition and thoughtful implementation, we can change our society for the better. We structure our recommendations in five chapters. We start with skills, putting people first, and with a responsible way of sharing data. Technology should be at our service, not the other way around. The next three chapters focus on technology adoption, innovation and better public service. In conclusion, we set out a few implementation principles, such as the need for overall ambition.

Set up a new learning deal – Technology and AI are transforming society and our job market. We currently lack both the capacity and tools to support this transition and our schools are not preparing the next generations for the 21st century. This is the reason why we propose a new learning deal; a universal skills building program for adults and more digital - as well as human - skills for our youth.

Develop a responsible data strategy – Trust is the cornerstone of any transformation. We believe in the need for a robust and up-to-date legal framework, ethical principles and more transparency. Moreover, data is the energy that will fuel the fourth industrial revolution. But data often remains inaccessible. We need to build a data ecosystem that facilitates more responsible data-sharing with reinforced open data policies, more collaborations and a platform with well-structured tools and approaches.

Support private sector AI adoption – It can be hard for companies, particularly SMEs, to start working with AI. It can be perceived as complex; companies might lack the internal resources and the iterative approach can be too costly. Hence, we propose to demystify AI through a lighthouse approach (training programs, large-scale events and social-impact projects). Secondly, we believe in more collaboration and accessibility to AI through a national AI hub. Lastly, we need to facilitate experimentation.

Innovate and radiate – We have world-class researchers, but our research is not at scale. Also, we have yet to develop, attract and retain enough AI talent. Lastly, it is hard for innovative start-up companies to grow beyond the early stages. Hence, we propose to position Belgium as Europe's AI lab through sandboxes and large-scale collaboration within academia, leveraging Belgian transposition of the GDPR. Next, we recommend creating more AI-related training programs, more focus on practical applications and more selective migration. Lastly, we suggest supporting the growth of our AI companies through an investment fund and by differentiating our expertise.

Improve public service and boost the ecosystem – Too few public organisations are currently experimenting with AI. Firstly, we propose that public institutions rethink their own roles and evolve towards a platform approach. Secondly, we need to give public institutions the tools to experiment; such as a rolling fund and more innovation-friendly procurement. Lastly, we recommend creating a Chief Digital Officer role to organise internal transformations and launch large-scale transversal projects.

A few principles to ensure a sustainable implementation: ensuring continued trust from the public, a European approach, collaboration between all stakeholders, a grass-roots/community-led approach, focus on specific areas (such as healthcare/life sciences) and, lastly, **daring to be ambitious and audacious. This will require an investment of at least EUR 1 billion by 2030.**

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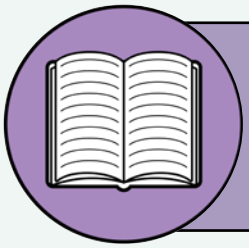

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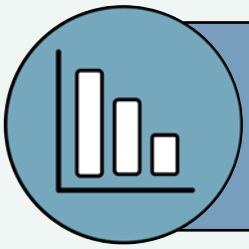

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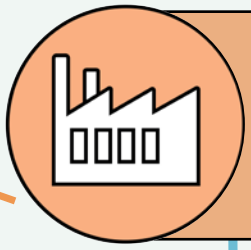

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SETUP A NEW LEARNING DEAL

Skills are the main building blocks for a prosperous economy, society and country. They are even more critical if we want to harness the benefits of AI enabled technology. Moreover, AI and digitisation are changing our labour market: new jobs will be created, many will change, and some might even disappear.

Because of the globalised market we operate in, the questions we must answer are quite simple. Do we prepare the public to address the challenges ahead? Or do we deny change and allow other countries to reap the benefits of this new transformation, leaving us to trail behind in the long run?

We believe there is no doubt about the path to follow and we should act now. McKinsey estimates that for 60% of jobs, at least one third of the tasks could be automated by 2030. These are not only manual jobs, but also, if not more, intellectual ones.

If, however, we can help our current and future workforce develop the much-needed skills for a data-driven age, we can ensure that these new jobs are developed in our country. For example, Agoria and Roland Berger estimate that by 2030, more new jobs will be required (864,000) than replaced (235,000). Furthermore, at least 300,000 workers will have to be substantially retrained, and the current workforce (4.5 million) will have to upgrade their skills. Paradoxically, this will influence office workers more than factory workers, since software is cheaper than robots.

The problem, however, is that Belgium is not ready for this transition. The reasons for this are twofold:
(1) While the transformations of our institutions show promise, our reskilling systems currently lack the capacity and tools to facilitate such a large transition.
(2) 21st-century skills are not included in school curriculums, leading our children to be underprepared for the opportunities ahead.

Our conclusion is simple: if we do not act now, what could be a great opportunity, might end up being a painful and sluggish transition. So, what we need, is a "New Learning Deal".

"We need a new Learning Deal."

Set up a universal skill building programme

The population continuously needs to upgrade its skills. The recent example of Proximus is a case in point. Certain workers need to be replaced and skilled workers for the new positions are hard to find. Today, we believe a sense of complacency has taken hold. Many citizens only rarely have the opportunity, or indeed motivation, to receive real extra training. According to the OECD, 4 out of 5 Flemings are not motivated to get training. Few put time or money aside to learn new skills. Most companies focus on training with short-term goals. Public reskilling programmes are underfunded, and the range of training is both insufficient in quantity and insufficiently tailored to the new economy. Lastly, we lack the tools to provide transparency and sufficient incentives for reskilling on such a large scale. Yet, our population is committed to a better future.

We need to create a momentum that urges all stakeholders, including trade unions, to invest in, and incentivise for, lifelong learning. We can do this, amongst others, by raising awareness on potential job changes. For example, further studies should be conducted on the impact of AI at work and the interaction between technology and people. Moreover, it will prompt a focus on the jobs most at risk in the next few years. The next step is to invite workers to identify their existing skills or skill gaps, for which the VDAB is already experimenting with AI.

We need to reassure people by providing more guided and financed training opportunities. Training focused on skills development should be elaborated so that individuals can choose the training that best matches their needs. This includes non-traditional training programmes to attract non-traditional students (e.g. MolenGeek). Lastly, we need to make lifelong learning an integral part of the core mission of all our schools, especially universities and university-colleges, and extend their student population to include an older population.

Create momentum

1 Create awareness and transparency on potential job changes and individual skill levels

2 Give all labour-market stakeholders the responsibility to invest in lifelong learning

3 Improve tools and standards to invite workers to identify skills or skill gaps and find appropriate up- and reskilling programmes

Train

4 Provide everyone with more opportunities to engage in lifelong learning

5 Enable rapid development of new training programs (including nontraditional ones to attract nontraditional students), not only focused on digital skills

6 Make lifelong learning a core mission of all our schools, especially universities and university-colleges

Prepare our children for the future

Today, we are at risk of sacrificing a whole generation. We believe our current education system does not equip our children with the skills they need to succeed in this new world. Early on and throughout their childhood, we need to teach our children 21st-century skills, so that they can really understand and talk "the language" of technology, while also reinforcing their human skills.

Estonian schoolchildren, for example, learn to code from the age of five. French school children will soon have programming as a core subject. In Belgium, we are only getting off the ground. Flemish students in their final few years of secondary education will now have computational thinking as part of their curriculum. There are some ambitious programmes outside the schooling system, like CoderDojo or Xperibird.be. Unfortunately, they lack the required scale. Moreover, it is often the most well-off parents who will urge their children to attend these afterschool programmes.

Children in our primary and secondary schools should get acquainted with coding, technology, and AI, from an early age. First, we must make STEM more attractive as a field of study, particularly for girls. Next, we need to incorporate algorithmic thinking in the curriculum and incorporate technological skills in the existing courses. As such, we should integrate the use of data in courses like geography, or indeed, treat coding as an added compulsory language. Lastly, it is important to stress the importance of developing a learning mindset, critical thinking, creativity, collaboration and other human skills.

This subject is no less critical for our higher education. Nor should it be limited to engineering. AI already has a major impact on most future jobs. Lawyers will use AI to find the relevant legislation; medical doctors will use AI to help diagnose diseases; farmers will use it to maximise their production. Consequently, being aware of their ever-changing future jobs, understanding the ethical dilemmas, students realise that the ability to use technology will be paramount. Unfortunately, higher education is not treating this changing ecosystem as a priority. Hence, these institutions are leaving their students ill-prepared for the changes ahead. We, therefore, must ensure that all higher education students receive at least a soft skilling, data, technology and AI courses in any field, which also covers the ethical aspects.

This requires a teaching corps that is equipped, trained for and comfortable with educating students in these new subjects. It is critical that they feel empowered and have the support and tools to continue to teach in the best way they can, but with a new focus.

Finally, AI can also be a tool in education. It can drastically improve quality and equity in many cases. AI enables more personalised learning and frees up precious time (e.g., faster homework correction) for teachers to focus on specific, more pressing topics. It can make school more accessible to stu

dents with limited vision or hearing. We are convinced teaching will remain a person-to-person activity, but we believe AI can represent serious added value for teachers and students alike. Hence, we recommend integrating AI methods to provide individualised learning tracks tailored to each student's proficiency level, learning style, and pace of learning. At the same time, AI technologies can help teachers enhance their teaching, using innovative tutoring and higher value-added interactions.

Primary and Secondary School

1 Increase focus on a learning mindset, critical thinking, creativity, collaboration and other human "soft" skills

2 Incorporate an introduction to algorithmic thinking as of primary school and invite children to interact with technology

3 Integrate coding as compulsory (to various degrees) language in schools and use appropriate methods (e.g., project-based and as part of team work)

4 Integrate the implications and use cases of technology and data in all types of courses (e.g., use of data in geography) in secondary schools

5 Increase appeal of STEM, particularly for girls

Higher Education

6 Introduce data, technology and AI courses across the disciplines and stimulate cross-disciplinary learning, which also covers the ethical aspects

Teachers

7 Train new, or upskill, IT and science teachers in algorithmic thinking and coding classes

8 Train current teachers to integrate data, technology and their implications in their courses

AI as an education tool

9 Deploy AI as a tool for individualised training adapted to each individual student

10 Apply AI as a tool for teachers to enhance their teaching

DEVELOP A RESPONSIBLE DATA STRATEGY

Data is the driving force behind the fourth industrial revolution. Following an increasing acceleration of digitisation over the last two decades, the world has been generating an immense volume of data. Governments in India and Estonia, for example, have digitalised the data of their population and centralised it in a digital ID programme.

However, most of our data is safely stored behind the firewalls of public institutions and private corporations. As such, it now remains largely untapped and underleveraged. If we want to unlock the potential of these resources, we need to ensure that key enablers are in place, particularly through a coordinated European approach.

"Data is the energy of the fourth industrial revolution."

"Public trust is the cornerstone of any AI and data strategy."

Build trust

The development, deployment, and use of AI must happen, but with caution for individual and collective rights. AI can indeed pose trust and ethical questions. For instance, AI often uses data based on human behaviour and, hence, can reinforce unwanted human bias. Multiple incidents have been shared in the press over the last few years: an algorithm mistakenly classifying black people as "gorillas" or a recruiting tool favouring men for technical jobs. Moreover, through their scalable nature, algorithms can create negative feedback loops and, in that way, deeply influence our society. For example, police presence based on historical crime can cause a further detection of petty crimes in problematic areas. These same petty crimes would go unnoticed in historically safer areas, further increasing inequality.

These challenges need to be addressed proactively by all stakeholders. After all, public trust is the cornerstone of any AI and data strategy. When it is lacking, innovation is off the table.

Firstly, government and public institutions must function as gatekeepers by ensuring legal security and coherence of the law, both at EU and national level. This framework must remain up-to-date and adapt to the changing environment. Hence, we believe it is vital to develop digital and AI literacy among policy-makers and regulators, and foster policy dialogues.

Secondly, it is important to introduce ethical guidelines to support the development, deployment and use of AI. To start with, companies and the public sector must communicate and be transparent about their data and AI ethics policies. As we speak, the European Commission is drawing up such ethics guidelines to develop trustworthy AI. Principles include human centricity,

accountability, non-discrimination, respect for privacy and transparency, all of which can be integrated through technical methods (e.g., traceability, ethics by design) and non-technical ones (e.g., regulation, accountability governance, awareness). In addition, a new role could be created to monitor compliance with these ethical principles: the digital ethicist. Moreover, we believe that, for algorithms that can profoundly affect public life, public institutions should integrate civil society in the design and decision process.

But even then, further guidance will be required, particularly in such a new field. As a final building block, a multidisciplinary ethical committee could provide guidance and help ensure a stable legal and ethical framework. Creating more legal certainty enables innovation, particularly in the context of trade-offs between collective benefits and individual constraints. Yet, we believe caution is needed for regulation in AI fields; there are too many different applications to allow for an overall regulatory brushstroke. Hence, sectoral regulators should incorporate the challenges of AI in their fields. As they will often lack the necessary expertise, they must have an organisation to turn to. Moreover, certain legal aspects will transcend sectoral questions. Therefore, this calls for a country-wide, a-sectoral and multi-disciplinary approach. Finally, we should avoid developing unique Belgian rules or standards; instead, we should tap into European and international developments so that AI applications developed in Belgium can easily be exported.

1. Develop digital and AI literacy among policy-makers and regulators, thus fostering policy dialogues that lead to a relevant and effective regulatory framework
2. Integrate civil society in processes that will profoundly affect public life (e.g., predictive justice)
3. Share guidelines and best practices on how to address ethical topics in business and public institutions
4. Demand from the private and public sectors to communicate and be transparent about their AI ethics policies
5. Create a Belgian ethical committee to provide industry, authorities and society with guidance on ethical and regulatory topics

"Organizations, companies and the public sector must communicate their data and AI ethics policies."

"It's important to introduce ethical guidelines."

Share data responsibly and proactively

Multiple public and private organisations do not yet share their data, even when allowed by GDPR. The legal changes are fragmented, with small steps iteratively pushed forward in a silo approach. Current impact from open data and only-once policies is limited. Even technically, access to public service data is restricted by the silo-architecture of IT, administrations and political leadership. In healthcare, large amounts of information, such as valuable imagery of cancer tumours, reside in unstructured text files. They, therefore, remain inaccessible for effective sharing among healthcare professionals, and for analysis.

Yet, data becomes more valuable when it is matched with other data and analysed altogether. Free flowing data will be required if Belgium wants to be successful in its digital transformation and position itself as an AI hub. To realise this ambition, we need to facilitate and encourage more data-sharing. Of course, the legal framework of GDPR, ethical rules, confidentiality, intellectual property, etc. must be respected. Moreover, we should further push the adoption of FAIR-principles; data should be Findable, Accessible, Interoperable and Reusable. Various EU-funded projects (e.g., EHDEN in healthcare) are embracing these principles.

An independent Belgian data-sharing platform can make more public data accessible by keeping it within the boundaries of a public institution. Instead of sharing anonymised data, the algorithm can be run within the sharing platform. In that way, the data can be used by outside players without the risk of re-identification. For example, the British OPAL and Walloon INAH initiatives are built on this principle.

Such platforms could also be used to facilitate data exchange with, and between, private players. This would require the creation of a Public-Private-Academic task force to help develop tools and protocols to safely share public data. Moreover, public and private players should identify together which could be the focus areas.

We believe the other required actions to facilitate responsible access to data are:

- Doubling down on open data initiatives and increasing transparency on targets and existing non- published databases
- Arranging private-public partnerships and G2G collaborations to share and work on using data together and setting data standards

1 Set up an independent Belgian data-sharing platform

2 Double down on open data efforts and increase transparency on targets and existing non- published databases

3 Arrange G2G or private-public partnerships to share data and develop c mon standards

SUPPORT PRIVATE SECTOR AI ADOPTION

AI can have a very significant impact on the private sector and our population. With AI, products and services can improve, and become better tailored to our needs. With AI, products can become more affordable. But first, Belgian companies must adopt the technology.

Even though many interesting use cases are emerging, Belgian companies are currently not sufficiently experimenting with AI. This is a challenge for both large and smaller companies. While smaller companies generally benefit from more rapidly adapting and being open to experimentation, larger companies might already have differentiated data sources, in-house skills and sufficient budgets for such experimentation.

Overall, leaders seem to lack the awareness of, and clarity on, potential use cases. Moreover, due to the complexity of the technology, the ones that do have the awareness often do not know what technology to use nor which stakeholders to approach.

To address this challenge head on, there is a need for a three-pronged policy: demystifying AI through the creation of AI lighthouses, ensuring collaboration and sharing of technology and access to financing.

Set up AI Lighthouses

It is crucial to demystify AI's challenges and opportunities. If not, AI can create fear and resistance among the public and certain organisations. Moreover, to create real momentum, we need to inspire our population and business leaders to invest (more) time in new technologies.

Countries like Finland and the Netherlands are leading examples in this regard. Both countries have developed an accessible MOOC to train their population. The Finnish "Elements of AI" aims to train 1% of the population. A Belgian institution could collaborate with these two countries to adapt such course to the Belgian population at once.

Furthermore, large events should be set up, showcasing Belgian talent, successes and potential use cases. It is a way of showing to the population that we already use AI on a day-to-day basis. Many such local events are already being organized. We believe they require more national visibility and see the need for a country-wide, large-scale event bringing all actors together, displaying Belgian quality AI to the outside world.

Lastly, the public sector should focus on building use cases that can showcase the benefits of AI. As such, we recommend setting up programmes to finance a selection of projects using AI for positive social impact (e.g., in healthcare, the environment or education).

1 Develop an open access MOOC for Belgian citizens to train 1% of the population

2 Organise a large-scale event that showcases Belgian AI successes

3 Set up a public programme that supports AI projects with positive social impact (e.g., in healthcare, the environment or education)

Bring the community together

In Belgium, many local collaborations, ecosystems and hubs are being set up. A country-wide, large-scale hub/platform, consolidating efforts and providing a one-stop shop for all information about AI in Belgium, is sadly missing. This Belgian AI Hub would be able to bring together technology providers, companies, academics, and the government. It should be built in collaboration with Belgium's top AI experts. They would have the credibility to attract other Belgian actors to come together and collaborate on an ambitious goal for Belgium. Moreover, it would also function as an interface between the Belgian and foreign AI communities. In this way, all stakeholders can collaborate on concrete applications and train their people. Europe's plan to invest in Digital Innovation Hubs throws up an opportunity that should be seized with both hands.

In such hubs, we should also facilitate the collaboration between companies to build common building blocks that are subsequently shared throughout the community. These can be:

Technological. E.g. law firms working together on Natural Language Processing.

Administrative. E.g. creation of standards, templates to diminish legal uncertainty or algorithms for property rights.

Organizational. E.g. setting up toolkits for organizations to identify AI readiness

Training. E.g. encouraging companies to build common training programs to spread common investment costs

1. Set up a Belgian-wide hub, certified as a European Digital Innovation Hub
2. Invest in common building blocks to reduce costs for innovators
3. Organise AI training (and introductions) at different levels (including company leadership)

Facilitate financing

AI projects can be costly, and their time-to-impact is hard to estimate. Financing can thus be a barrier, particularly for smaller organisations. This problem can be alleviated not only by creating financial instruments to support SMEs in fast-use case validation programmes, but also, by supporting SMEs to tap into European programmes like Digital Europe, Horizon Europe or CEF.

1. Set up financial instruments for SMEs to experiment with AI
2. Support SMEs when applying for European investment programmes

"It is crucial to demystify AI's challenges and opportunities."

INNOVATE AND RADIATE

Belgian universities, research labs, SMEs and start-ups have proven our capacity to innovate time after time. They have demonstrated beyond reasonable doubt that we are worldwide leaders when it comes to breakthroughs in a variety of disciplines. Just think of our pharmaceutical or biotech industries, the theory of the Big Bang or even the discovery of the Trappist-A planetary system. The same can be said about our long-standing tradition and expertise in AI.

Yet, our research is not at scale. We fail to develop, attract, and retain enough AI talent. Moreover, we may have several successful and highly innovative start-up companies, it is hard for them to grow. This is a European-wide problem. Let this be a wake-up call. The time to get re-acquainted with our past accomplishments, and prepare for the future, is now.

"We are worldwide leaders when it comes to breakthroughs in a variety of disciplines"

Make Belgium Europe's AI lab

Belgium's implementation of GDPR and its Article 89 enables more flexible research in the public interest than is possible in other European countries. This advantage can help us set up sandboxes and position Belgium as the European AI Lab for research. Since other countries might well follow suit, we should seize this opening rapidly.

In addition to the legal aspects, sandboxes require infrastructure. Such projects are already underway in cities like Antwerp or in the social security sector. This approach should be rolled out country-wide. A few locations and themes should be identified (e.g., healthcare, environment, mobility or smart cities) where such infrastructure should be put into place. Success will largely depend on whether enough high-quality data can be mobilised, and the necessary computing power can be achieved (centralised or decentralised). Furthermore, we propose to temporarily reduce legal constraints on specifically selected projects to allow for more experimentation. Such a sandbox approach will also support the adoption of AI in the private sector.

To position Belgium as Europe's AI lab, we must reinforce the scale and reach of our research laboratories. We have world-class researchers and our research institutions punch above their weight. A little-known fact, for instance, is that Belgium is in the global top of AI publications per capita (SJR). Yet, our current lack of collaboration and scale limit our foreign traction. For example, the World Intellectual Property Organization reports that not a single European organisation is among the top 10 of most requested AI patents. Hence, we propose to set up a Belgian confederation of AI labs and to increase incentives for collaboration (amongst themselves and with industry partners). Furthermore, this integration does not have to stop at our border. Our location at the heart of Europe is a clear asset to build upon, for example by collaborating with initiatives such as CLAIRE and ELLIS.

In addition, we propose to gather research experts into a Belgian AI institute, welcoming inspiration and collaboration with industries. The UK's Alan Turing-Institute, rallying 13 universities whilst positioning itself as the national institute for AI, could be a source of inspiration. Large-scale, ambitious projects should be co-organised by these academic consortia, along with public and private players (e.g., in healthcare). These should have very concrete applications and more experimental approaches to fuel our innovation power.

These different measures, combined with strong communication and an active attraction policy, can bring private research institutes to Belgium.

1. Position Belgium as the European AI Lab, using Article 89 of GDPR and setting up sandboxes
2. Create a confederation of Belgian laboratories and join European initiatives (ELLIS, CLAIRE)
3. Set up a country-wide AI-lab to foster collaboration between individual researchers
4. Set up large-scale blue-sky projects to fuel research
5. Actively chase private research initiatives to bring them to Belgium

"Set up sandboxes and position Belgium as the European AI lab for research."

Develop and attract world-class data and AI talent

There are many Belgians among the international top AI experts and our universities are internationally recognised. Yet, we must grow and attract more AI talent.

Overall, while growing, the AI offering in Belgium is limited and insufficiently visible. A recently created post-graduate course at KU Leuven is proof of the potential success of such programmes. It also shows the current lack of AI programmes. Yet, while university-college PXL is developing an AI bachelor programme, to date, no full AI Master or Bachelor programmes exist. Moreover, while many engineering students attend AI classes, this is not showcased sufficiently. In contrast, the Netherlands, Finland, France and the UK do have full AI programmes. Filling this gap in Belgium will require the collaboration between universities both regionally and nationally and the necessary political will. We must not forget there is a need for different approaches:

- Data Translator and Business Analyst programmes combining strong domain and AI-methodology knowledge
- High-level Data Engineering/Architecture programmes
- Interdisciplinary AI Master programmes (e.g. between medicine and engineering), potentially through collaboration of different universities
- Increased visibility and recognition of current AI courses by creating more AI minors in Bachelors and AI majors in Masters
- A country-wide AI/Machine-learning PhD college, combining existing graduate courses and offering new collaborations between AI PhD students across universities.

While a real AI expert might need full Bachelor, Master (and potentially PhD) training, many other skills require shorter programmes. For example, the Belgian organisation BeCode hopes to train 600 programmers annually based on the curriculum of just one semester. They are now setting up an AI school, for which students only require coding skills. Another successful example is DataCamp. Backgrounds of their students are very diverse and show the different profiles that can, and must, be trained. The next step is to look for collaborations between universities and the public and private sectors. Computer science and AI students should be encouraged to work on practical applications with various industries and vital public sector institutions (like healthcare, defence or fraud detection). In Germany, the UK and Ireland for instance, this is compulsory in certain Master programmes. Globally, much of the most advanced (research) work is now also done in private companies.

In addition to growing local talent, we must attract foreign talent as well. Companies are already struggling to source the necessary skills.

This issue will only grow with increasing AI adoption. Regardless of political ideology, barriers to selective migration for top talent are currently too stringent. Belgium is already attracting several talented individuals and building on that exchange. However, this comes at a high administrative cost, failures and shortened stays. We must turn this around and encourage talent exchange and selective migration of high potentials with a proactive focus on developing regions. We recommend, for example, that visa procedures be simplified for AI Master and PHD students and that their stay be extended after defending their PhD dissertation.

1. Create multiple AI Bachelor and Master programmes
2. Create shorter programmes to develop AI-related skills (e.g., data translators, programmers)
3. Set up partnerships with industry and public sector to allow AI and PhD students to work on practical applications
4. Facilitate selective immigration and visa policies for top foreign talent

Grow Belgian and European AI leaders

The Belgian economy must thrive on its innovation. Hence, we must ensure the emergence and growth of Belgian and European AI leaders. Multiple Belgian companies and start-ups are already recognised internationally, but we need more, and we must enable them to grow.

We know that in Belgium and Europe, the transition from start-up to scale-up is typically challenging. Hence, we propose to set up a dedicated public-private matching scale-up fund to facilitate financing.

We also propose to highlight European and Belgian expertise, focusing on ethical-by-design applications.

1. Support scale-up growth through a large-scale AI public-private matching investment fund
2. Highlight European and Belgian expertise, focusing on ethical-by-design applications

IMPROVE PUBLIC SERVICE AND BOOST THE ECOSYSTEM

Our citizens expect from the private sector state-of-the-art services on a 24/7 basis. They increasingly expect the same from the public sector. Rightly so. Tax-payers are entitled to expect high quality of service from their government. Today, this is not always the case.

AI and related technologies, however, offer the opportunity to provide better, cheaper and faster public service. These technologies can allow civil servants to focus on high added-value tasks, to make Belgium more competitive and to generate new services. Lastly, due to the weight of the public sector in our economy, its adoption of AI can also help start-ups and researchers develop.

We have observed significant (digital) transformations in several public institutions and Belgium is high up in Digitisation rankings such as DESI. Yet, we must prepare better for an AI-based economy. For instance, Belgium ranks 18th in the Government AI Readiness Index produced by Oxford Insights. At the current pace of change, our institutions will not only miss the opportunity to better serve civilians and organisations, they could thwart the transformation of the economy.

Currently, only few public-sector organisations are experimenting with AI. Bottlenecks include lack of internal skills, lack of budgetary flexibility, resistance to change, lack of political direction and silo-mindsets in terms of collaboration and data-sharing. Moreover, public institutions are not used, or indeed encouraged, to work with the inherent trial-error methodology required for AI. After all, current project approval systems are focused on minimising risks.

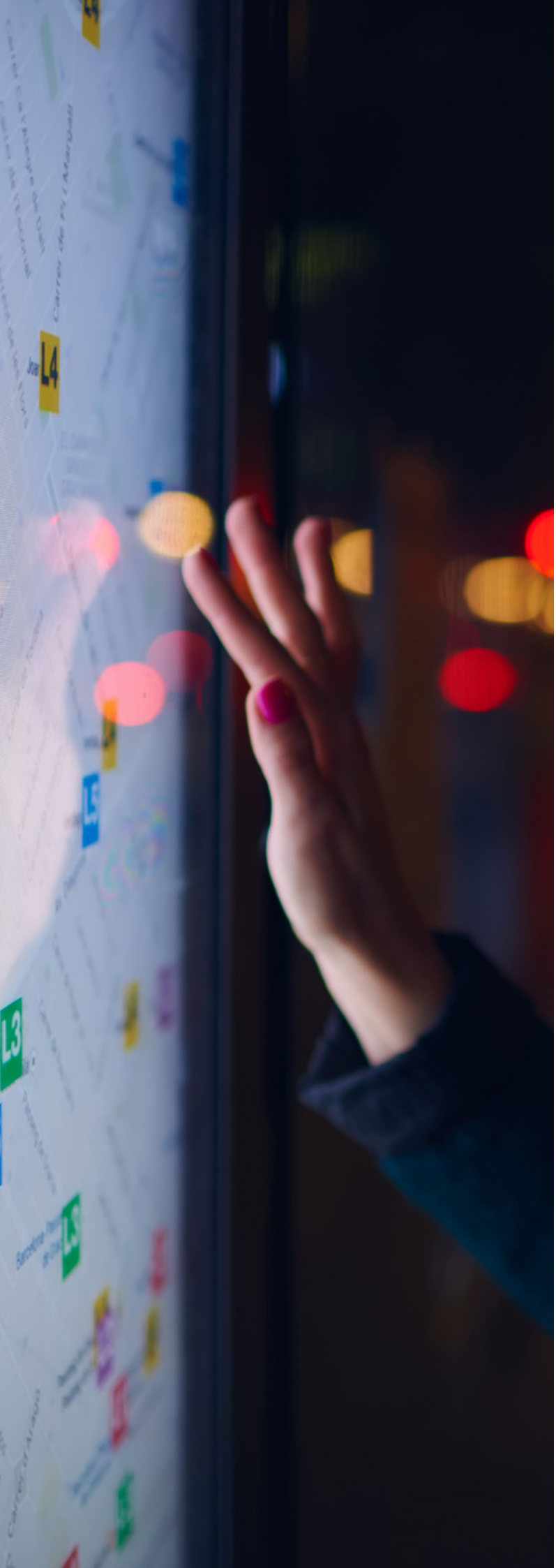
We believe public institutions should rethink their own role, evolving from providers of public service to "facilitators" and "platforms". Instead of wanting to ensure that all public service is being developed and executed in house, they should look for cooperation with specialised actors that are most suited to ful fil these tasks. Public institutions would hence play an active role in a broad-scoped ecosystem. This requires a comprehensive and flexible regulatory framework, one that secures an ecosystem within the boundaries of our values.

We believe it is necessary to provide the tools to public institutions to experiment more freely and rapidly. Public institutions should be assisted in identifying AI-related opportunities and solutions. Those without the capabilities should be able to present their ideas to a team of experts. Approved projects can then be backed by a national AI fund, with gains partly reinvested. A highly skilled, centralised task force can help with the experimentation, exploration and then operation of AI. It is critical that all projects start from a business problem with a clear return on investment in mind.

To support economic development, public institutions could also open up more to SMEs. Initiatives such as Public Procurement of Innovation and Pre-Commercial Procurement have already been put in place. Yet, public institutions should utilise such techniques more often, particularly narrowing the funnel of suppliers at a later, more informed stage.

As highlighted in the National Pact for Strategic Investments, organisational transformations will also be required. All digital initiatives must be coordinated by central organ, headed by a Chief Digital Officer. It could play a role in the governance, including ethical aspects, but could also have a say in better coordinating AI academic programmes across research centres and universities.

Inevitably, this large-scale transformation of the public sector will take time. Therefore, we need to guarantee continuous support and improvements. To succeed, we propose to select ambitious lighthouse projects, bringing together a high number of actors.



Examples of such projects are:

- AI-based advisory tools supporting doctors to improve patients' treatment plans, leading to better health outcomes
- A common risk assessment and fraud detection engine for FPS Finance, the social security sector, the Federal Police and FPS Justice
- Autonomous driving proof of concepts in collaboration with different cities

Multiple, smaller-scale quick win projects should be launched in parallel. This will facilitate the adoption of such applications in more reluctant organizations and accelerate the public sector's learning curve. This should be done by encouraging intra- and inter-departmental use cases, with a specific focus on breaking through data silos across agencies and facilitating the use of data models across organisations and disciplines.

Examples of such projects are:

- Chatbots for basic functionalities that can be reused throughout public institutions
- Identification and automation of simple administrative tasks

1 Rethink the role of public institutions towards platforms managing an ecosystem, instead of service providers

2 Create a rolling fund and task force for experimentation with AI in public institutions

3 Redesign public procurement processes to enable trial and error, not excluding young organisations

4 Make organisational improvements by appointing a central Chief Digital Officer to coordinate nationwide efforts

5 Select a few high value use cases within public institutions to improve service, focus efforts, create momentum, build expertise

Our implementation principles

Trust

This transformation is not possible without public support. We believe a public debate is necessary to ensure our population is familiar with AI's positive prospects, but also its possible pitfalls. Additionally, we believe in the need to develop trustworthy AI: one that is human-centred, includes ethical values, is transparent, and explainable. Lastly, we need close collaboration between developers and consumers, along with a true interdisciplinary dialogue.

A European framework

As a small country, never mind its regions, Belgium might not be capable of developing a sustainable AI eco-system. Our strong connection with European countries, combined with our position as policy and regulatory hub, is a trait we can, and should, play to our advantage. Moreover, the European Union investment programs are increasing their commitments for AI. Belgians have always believed in "Strength through unity".

Collaboration

Many successful AI-initiatives are already underway. Yet, for transformative impact, we must develop one common vision. For example, this entails, collaboration between universities and companies, between our regions and the federal level, and between start-ups and public institutions.

Grassroots

We are a grassroots, multidisciplinary group that believes in the need for change. AI is the result of human ingenuity looking for answers to various human desires. This vast complexity means it might never successfully be led by a central government. We believe the community should play an active role in setting the AI agenda, hence our AI 4 Belgium Coalition

Focus

A focused approach is needed to maximise effect. Such areas could be selected based on three main criteria:

1. Where do Belgian companies have a competitive advantage?
2. Where can we spot high-value-use cases?
3. What improves the quality of life of Belgians?

Healthcare and Life Sciences are particularly promising. Moreover, energy, mobility, predictive maintenance and the public sector are also of interest. In addition, we see the need to focus on the ecological transition, one of the core challenges of our era.

Scale and ambition

We must build on our strengths, because we have many. Actions must match the size of the opportunities ahead. According to Microsoft and PwC, Finland will be investing EUR 160 million in the next four years. In the coming four and seven years, France and Germany have announced an investment of EUR 1.5 and 3 billion respectively. Boston's MIT alone is setting up a USD 1 billion AI school. AI investments (including private) in UAE reportedly account for close to USD 10 billion. China even committed USD 150 billion over the next decade. The global race is clearly on.

Based on a yearly per capita investment, to match Finland, France and Germany, **our minimum ambition level should be EUR 80 million per year. This corresponds to at least EUR 1 billion by 2030.** Yet, we believe that looking at the USA and China, who understood the required ambition, **we need to be even bolder**.

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