FOD Beleid & Ondersteuning
SPF Stratégie & Appui

National convergence plan for the development of artificial intelligence

Becoming an AI Smart Nation

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Introduction

Artificial intelligence is already having an impact on our daily lives and will continue to change the world by contributing to the well-being of citizens, our prosperity and development. AI also offers an excellent opportunity to address numerous challenges in various fields such as the economy, energy, health, mobility, climate change, the war on disinformation, and security. At the same time, we must take particular care to protect fundamental rights such as privacy and non-discrimination, and ensure that new technologies are developed within an appropriate ethical and legal framework.

In other words, to **create a Smart AI Nation** in which truly every citizen shares in the benefits AI provides, it is important that we can rely on AI systems that are developed and used in a legally, ethically and technically sound manner. There is a real need for such trust to make AI widely adopted in society and drive innovation in socially useful AI.

If Belgium and Europe want to become front-runners in the global economy, **we need to promote the development and application of AI in our country**. Belgium is a real challenger in international rankings[1] and can in particular be proud of its excellence in research and the potential of its AI start-ups and scale-ups[2]. We need to take that as our starting point and accelerate our development to seize opportunities and promote our know-how internationally. That is why Belgium is working on an ambitious AI convergence plan.

Given the societal stakes, the challenges ahead and the many actors involved, we will **only succeed in integrating the potential of AI at the national level** if this is done **in synergy with** the federated states that have been pursuing a very dynamic policy for the introduction of AI for several years. The regions have already had ambitious AI plans approved by their governments and are currently implementing them. Several institutes have been set up to support large-scale projects under territorial priorities. In particular, these plans include research funding, training initiatives, financial

[1] Global AI Index: Belgium, rank 27, by Tortoise; January 2022.
[2] See www.ai4belgium.be/ai-landscape.

guidance, assistance in integrating AI into the operations of companies and organisations, from the business plan to prototyping, commercialisation, and research into the socio-economic impact of AI.

By becoming a #Smart AI Nation, we are preparing our future together, aiming to lead a digital transformation that goes far beyond mere technologies.

Objective 1 - Promote reliable AI

AI is a technology that can be applied in all areas of society and the economy. The rise of AI is sometimes referred to as the Fourth Industrial Revolution, because it sometimes brings huge changes. It is necessary to consider not only the opportunities and benefits of AI, but also its risks. AI sometimes works in a complex or non-transparent way. It is therefore important to be able to understand how it works, its results and the consequences from the design phase onwards. If AI is used properly, it can contribute to protecting human rights, democracy and the rule of law – three fundamental pillars of our society.

The Belgian population is positive towards technological change. The study [3] on the "perceptions of artificial intelligence" shows that the vast majority of Belgian citizens believe AI can help improve society. No less than 94% of study respondents had a positive perception of AI applications in relation to health and science innovations, and 89% were positive about the expected reduction of errors or accidents that occur due to humans.

At the same time, certain fears are also surfacing and there is a need for educational communication on the one hand, to explain these technologies and their use and impact, and on the other hand to reassure the public that an ethical and legal framework is being prepared to ensure the responsible design, development, deployment and use of these technologies. Responsible, people-centred use and trust are fostered through the principles of transparency, non-discrimination and diversity, protection of fundamental rights (especially privacy), data governance, social, economic and environmental well-being, technical robustness and security, etc.

[3] Study on perceptions of artificial intelligence, conducted by IPSOS and FPS Economy, 2019 https://www.ai4belgium.be/wp-content/uploads/2019/04/enquete_nl.pdf.

Algorithmic biases (economic, statistical, gender, etc.) are also a real challenge. Ensuring fair data processing is therefore crucial to avoid any discrimination and ensure greater trust. It is important that the data are representative. By making the datasets on which algorithms rely more representative of women, people belonging to ethnic-cultural minorities, the elderly and other categories of people, we can protect ourselves against this algorithmic bias.

Complete the legal, institutional and ethical framework

AI is not used in a legal vacuum. Many regulations already apply to current AI systems. Data protection rules and the anti-discrimination law are just two examples. However, current regulations may not be able to fully cover the design, development, deployment and use of AI because AI is evolving so rapidly. **So new rights and obligations may be needed** to ensure that the framework for AI innovation provides the necessary protection (for fundamental rights, consumer rights, etc.), and that it is accessible and transparent to all users of AI services whose results of automated data exploitation have an impact on the specific situation of both citizens and businesses.

On 21 April 2021, the European Commission published a proposal for an EU regulation on artificial intelligence, known as the "AI Act"[4]. The proposal has the dual purpose of protecting the fundamental rights of individuals from the harmful effects of AI and aligning member states' regulations to remove potential obstacles to trade in the single market. As such, this proposal is an important step forward to ensure legal integrity for both AI developers and users while ensuring that there is room for innovation.

The initiative also seeks to establish a **national supervisory authority** to ensure AI is used in accordance with legal rules. Implementing the future "AI Act" will therefore require adapting the Belgian institutional landscape.

[4] Proposal for a Regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (Artificial Intelligence Act) and amending certain Union legislative acts COM/2021/206 final.

It is not enough for AI systems to comply with legal frameworks, they must also **respect society's ethical values**. Since AI is a multi-faceted technology that interacts with many other technologies, a sound ethical framework needs to be created. This framework needs to address the impact of AI on certain fundamental rights of citizens and workers, such as privacy, dignity and non-discrimination: standards that must be respected, especially in this rapidly changing labour market.

Impact assessment models are being developed. These urge AI developers and users to assess the impact of AI systems not only on legal standards, including human rights and fundamental freedoms, but also on ethical standards. Indeed, tools and recommendations can help ensure that legal obligations are applied appropriately and ethical standards are met.

In recent years, a number of ethical frameworks have been developed to help AI designers, developers, implementers and users to consider ethics from in the design phase ("ethics by design") and throughout the life cycle of AI systems.[5] On 16 December 2021, the Special Consultative Commission (SCC) on Consumption issued a recommendation entitled "Liability for artificial intelligence – some aspects"[6]. In this opinion, the SCC Consumption points out that numerous uncertainties still exist in the field of artificial intelligence, leaving ample opportunity for the legislator to reflect and debate on the subject.

Developing an ecosystem that can build trust in AI use within society also requires **a dialogue with citizens and businesses**. This makes it possible to identify their needs and concerns, promote the economic and social acceptability of AI, and encourage the design of human-centred services.

Citizens and businesses should be able to decide for themselves to what extent they want AI to affect their living situation. It is therefore essential that citizens and businesses understand what AI is, its capabilities and limitations, how AI can be responsibly developed and used, and what the legal consequences of an AI decision may

[5] European Commission, Directorate-General for Communication Networks, Content and Technology, *Ethical guidelines for trusted AI*, Publications Office, 2019, https://data.europa.eu/doi/10.2759/54071.
[6] https://www.ccecrb.fgov.be/p/nl/940/aansprakelijkheid-inzake-artificiele-intelligentie.

be. The purposes of using of AI must therefore be included in the specific legal frameworks. As AI is increasingly being used in all environments, it is also necessary for citizens and businesses to acquire the necessary skills to work with AI[7].

In addition to the aforementioned ethical framework to ensure that citizens' fundamental rights are respected when developing and implementing AI applications, the "digital divide" must also be taken into account. This is the gap between those who have the resources and skills to take full advantage of digitisation and those who do not. In particular, this concerns low-income groups, the elderly, the disabled, etc.

ACTION LINES

- actively contribute to the development of norms, standards and recommendations at international fora
- strengthen the ecosystem by connecting universities, business, the public sector and citizens
- complete the national regulatory framework, including the ethical framework for AI applications, while ensuring a balance between protecting against the risks of AI and encouraging useful innovation
- develop tools to support users of AI systems
- contribute to the implementation of the future "AI Act"
- adopt a governance framework for AI use in the federal services, by setting up an advisory committee on ethical AI use in the operation of government departments
- raise awareness among Belgian actors of the ethical challenges of AI
- fund and promote research on the individual and societal impact of AI systems in order to anticipate new ethical challenges
- identify algorithmic biases and mitigate forms of discrimination using specialised digital tools.

[7] At the national level, several initiatives aimed at raising awareness around AI already exist. For instance, all citizens can take the online course "Elements of AI", which aims to make AI technology understandable.

Objective 2 - Safeguard cybersecurity

Our society and economy are experiencing tremendous change due to the digital transformation. Tens of billions of devices are now connected to the internet and this growth is likely to continue. These devices are generating more and more data. That paves the way for large-scale data analysis using advanced methods and especially artificial intelligence.

While the social and economic benefits of digital transformation are enormous, this evolution also goes hand in hand with **new privacy and security** risks. In addition to phishing and the other well-known threats, more and more sophisticated cyberattacks are occurring. These also have major implications for Belgium, which plays a central role in the European political and economic landscape.

With the increasing complexity of systems and an exponential amount of data, defending digital systems with human operators and/or simple rules is a hopeless task. Over the past decade, **AI techniques have become quite important for defending digital systems** based on the analysis of processes and events. Examples include malware detection and intrusion detection. AI also makes it possible to apply new techniques, such as behavioural biometrics.

Conversely, the **cybersecurity of AI systems** also requires adequate attention. After all, AI systems process large amounts of sensitive data and make important decisions. For this reason, all steps within the data processing chain, from the acquisition of data and the training and updating of models to the automated decision-making process, must be fully protected. These steps must be protected from unauthorised changes and it is also important to prevent the leakage of confidential information and large-scale privacy breaches. Overall, technical, organisational and legal measures are needed to ensure accuracy, transparency, accountability, explainability and fairness.

An interface exists between AI, cybersecurity and privacy and this means that an **integrated effort in terms of research and development** is required with experts on these topics; they must work together to create innovative solutions. To promote such development, awareness and training are needed. The next step involves defining a joint research programme and developing innovative solutions; these can be shared research infrastructures but also specific solutions or tools. This R&D effort requires coordination and alignment, support for new research projects and measures to encourage technology transfer.

LINES OF ACTION

- ensure consistency between AI policy, cybersecurity and privacy
- continue to develop synergies between the various authorities and actors with competence in the matter (CCB, the Cyber Security Coalition, BIPT, GBA, BOSA, IVC, etc.)
- identify AI applications for cybersecurity and cybersecurity applications for AI
- establish and strengthen international contacts, both at academic level and in business institutes
- launch co-creation initiatives in cooperation with universities
- share experiences of concrete projects and identify future projects between academia and industry with the possible support of the various federated entities, the federal state and the EU
- collaborate on new AI-based techniques to improve cybersecurity (e.g. via sandboxes)
- recruit and develop local talent within a start-up culture.

Objective 3 - Strengthen Belgium's competitiveness and attractiveness through AI

On the economic front, studies clearly show the impact of integrating AI technologies into businesses. A study by the European Commission (EC, 2020)[8] shows that just over 40% of European companies are already using at least one technology related to artificial intelligence. When we analyse the adoption of AI technology in Belgium, we find that only 10.3%[9] of companies are using it.

Countries that are among the top AI performers will have an increasing share in AI's global economic impact. We see the same situation among companies. The pioneers or *early adopters* who will start deploying AI in the next 5-7 years, representing an estimated 20-30% of companies, could double their cash flow by 2030. For *slow adopters* , it would only be a small 10% increase, while non-users could even face a 23% drop in their cash flow over the same period[10].

AI and other advanced digital technologies such as blockchain, the Internet of Things (or IoT), new web protocols such as Solid and in the longer term quantum computing, will have a very significant economic and societal impact in the coming years. It is therefore crucial to ensure optimal conditions so that companies, especially our start-ups and scale-ups, enjoy a "first-mover advantage" in these

[8] https://www.ipsos.com/sites/default/files/ct/publication/documents/2020-09/european-enterprise-survey-and-ai-report.pdf.

[9] https://digital-agenda-data.eu/charts/desi-see-the-evolution-of-two-indicators-and-compare-countries#chart={%22indicator%22:%22desi_idt_ai%22,%22breakdown%22:%22ent_all_xfin%22,%22unit-measure%22:%22pc_ent%22,%22ref-area%22:[%22BE%22,%22EU%22]}.

[10] McKinsey Global Institute, 2018.

technology sectors. This will help maintain a thriving ecosystem and avoid losing value to foreign countries.

This point is indeed fundamental. When we consider public and private investment in R&D and AI innovation in China and the US and compare it with that in the EU, we find that it is 3 or 4 times higher than in the EU. The catch-up to be made up is therefore considerable, as the investments made today are the basis for tomorrow's technological advances. The dominance of the US and China in the global AI market is mainly the result of investing massively in R&D and innovation. Moreover, the EU plans to increase its investment in this area fivefold by 2030.

Promote the adoption of AI by businesses stimulate, facilitate research and technology transfer

Analysing the landscape of AI start-ups and scale-ups in Belgium shows the **enormous potential of the sector**, **especially in terms of AI adoption by companies** that have not yet deployed AI. The current application rate in Belgium is estimated around 20-25%[11]. The European Commission's Digital Compass[12], published in March 2021, indicates a 75% adoption rate of cloud/big data/AI technologies by 2030.

Belgium is among the European average in this respect. However, SMEs face a bigger handicap given that the application gap between small and large companies is wider in Belgium than in the rest of Europe. However, the rate of adoption of technologies for machine and process optimisation and the detection of anomalies and fraud in our country is significantly higher than the European average. This shows that Belgium has **advanced expertise** in various AI domains. According to this study, the main difficulties faced by companies wishing to use AI are related to the scarcity of available skills, the scale of organisational change caused by the technology and, to a lesser extent, legal uncertainty. This calls for strong government measures to develop AI skills and policies to

[11] Landscape of AI start-ups and scale-ups in Belgium, compiled in 2020 by AI4Belgium, https://www.ai4belgium.be/nl/ai-landschap.

[12] Europe's digital decade: objectives for 2030 | European Commission (europa.eu).

encourage investment in the technology and organisational change.

Open online **training courses**[13] accessible to all, such as "AI in Business", "Sustainable AI" (developed by Agoria et al) and "ElementsofAI" (supported by KU Leuven, UCLouvain, BOSA-AI4Belgium and their partners) and inspiration sessions with real use cases, promotional campaigns around the introduction of AI ("Boost your SME with AI") provide concrete explanations of what AI can mean for business.

In terms of innovation, there is a need for **a framework for the use of "sandboxes".** Sandboxes can be used to launch pilot projects (including cross-border ones) in a secure and controlled environment; they can be carried out in consultation with the relevant regulatory authorities. In other words, a framework is created with a lower regulatory threshold in order to encourage and support innovation. Companies can run live tests and have the opportunity to gain market acceptance.

More generally, the public sector can further support innovation by making available its infrastructure, networks and technological tools for industry, with the aim of accelerating the growth of **our start-ups and scale-ups**.

In 2020, the Federal Holding and Investment Company (FHIC) elaborated its own plan, including a roadmap for the digital development of the "New Economy". The recommendation given in this plan was to set up a "Deep Tech" fund, operating mainly in Belgium and to a lesser extent in neighbouring countries, with an investment capacity of tens of millions of euros. This fund has to be structured around a so-called venture builder/start-up studio. The fund aims to meet 2 needs:

- financial support for projects that spend 18 to 24 months in the "venture builder/start-up studio" to generate an economically sustainable business model
- financial support for companies coming out of the venture builder/start-up studio so that they can secure funding from more traditional investors.

[13] These are better known as MOOCs (Massive Open Online Courses).

In this way, it should be possible to valorise the results of applied research on AI and "Deep Tech" by our academic institutions and research centres and ensure that the companies operating within these fields retain their Belgian anchoring.

Furthermore, **technology transfer** is one of the main keys to strengthening our economy. Networking and support to technology transfer agencies in these fields are to be encouraged.

LINES OF ACTION

- demystify AI and its potential by demonstrating concrete AI applications to the entrepreneurial public
- set up more initiatives to provide information and support for SMEs regarding AI, with a role for research centres
- stimulate AI research and innovation by exploring the feasibility and effectiveness of a range of tax-related measures
- launch a voluntaristic incentive policy to keep our top AI researchers, whom US or Chinese companies/research centres would be only too happy to hire, in our own country
- introduce a regulatory framework for the use of "sandboxes" to allow businesses to experiment with AI applications
- encourage inter-regional AI projects between SMEs by further developing the existing "BEL-SME" tool, which has a strong focus on AI
- boost Deep Tech investments, including AI, in co-operation with the FHIC
- provide more opportunities for funding by BELSPO of AI-related topics which could facilitate inter-regional research co-operation on AI
- establish a partnership with the European Space Agency to use AI to process earth observation data.

Objective 4 - Develop a data-driven economy and a high-performance infrastructure

Over the past decade, data has become an indispensable tool to address important social and economic issues. The algorithms used for AI must be fed with large amounts of data from different sources. It is therefore essential **to strengthen the infrastructure and data ecosystem** to feed AI algorithms.

In this respect, the European Commission has developed a global data strategy to make the EU a leader in terms of the data-driven society, a leader that complements and supports the AI strategy. The Data Governance Act (the Data Governance Regulation) is part of the European data strategy, just like Open Data, the GDPR, as well as the regulation on the "free movement of non-personal data" and the future Data Act. All these regulations aim to provide a legal framework to strengthen trust, interoperability, security and by extension the sharing of data. It has become important that **government data can be reused**, that third parties can access data silos in the private sector and that citizens have the opportunity to share or make greater use of their personal data. For example, the creation of a Health (care) Data Agency reflects the importance and need to facilitate the reuse of health (care) data for research and innovation in the interest of patients and to improve care.

The federal government already provides free access to a number of databases. This allows users to access and use data on a particular topic as they see fit. Freely accessible data also play an important role in the development of partnerships between public organisations and private organisations. These partnerships can be fostered on the basis of data connections.

AI needs **digital, reliable and structured data** to learn, to validate models and to add value through inference. This is the case, for example, for technologies fuelling the development of the Internet of Things. And last but not least, ensuring privacy is a fundamental objective of a data governance strategy.

At the same time, it is important that the data strategy is supported by a **high-quality infrastructure** that provides connectivity to advance AI applications. The various AI projects need a solid foundation, not only to be credible and effective, but also to be robust and suitable for business use.

Also, the data used for AI must be digitally processed, stored and secured continuously and must also be transferable. Different kinds of infrastructures exist: physical, such as a server in a data centre, or virtual, when computing and storage capacity are in the cloud. In this context, particular attention must be paid to data protection issues given the potential consequences and risks. Depending on how AI projects evolve, the infrastructure will need to offer different levels of capacity and flexibility to support potentially hundreds of thousands of users.

LINES OF ACTION
• include the AI dimension in the development of a data management strategy, including the generation and digitisation, formatting, security, transfer and storage of data • encourage knowledge companies and knowledge institutions to open up their infrastructures and data to entrepreneurs and SMEs with a view to developing new IA solutions • integrate the technological foundations of infrastructure into AI training courses • improve access to cloud services by combining offerings from selected providers and/or through a consolidated framework agreement on information and knowledge sharing • strengthen the development of a competitive national and European AI infrastructure that can activate AI

among all stakeholders, including public services, SMEs, start-ups, research and education
- provide guidance to institutional and private clients for their AI initiatives
- optimise the reuse of government data by facilitating smart data, processes and outcomes through data standardisation and AI use (automated data analysis, AI4Gov hackathon).

Objective 5 - AI is at the heart of healthcare

Healthcare is currently facing many challenges. To effectively tackle food scares, epidemics, ageing and chronic diseases, targeted diagnostics and high-quality treatments must be ensured. At the same time, expectations regarding the development of new drugs continue to rise. This highlights the **importance** of **continuous innovative thinking**.

We need to explore new, more efficient tools to meet current and future healthcare challenges. AI will never be self-sufficient in healthcare, but it can be an excellent tool, provided its use is guided and mastered (training) and we are aware of the guidelines and limitations. AI can simplify and speed up the process while improving its quality; it can be used to overhaul a hospital's internal operational and organisational processes and foster a culture of change in e-healthcare.

Provided it is properly supported, AI offers healthcare new opportunities in prevention, diagnosis and treatment as well as in logistics. For instance, AI tools are being used to accurately analyse cancer cells, leading to better diagnoses. AI applications can read X-rays, enabling faster recognition and analysis of diseases. Technology can help create a **more efficient healthcare system that proposes treatment based on patient needs**. Intelligent solutions can help improve the quality and consistency of patient treatment. A modern and efficient healthcare system must use artificial intelligence as a tool to provide added value for patients and their families[14].

For **hospitals**, artificial intelligence offers new opportunities to manage patient treatment logistics more effectively and accurately. For **doctors**, artificial intelligence can be a support tool (e.g. through a knowledge transfer) and AI can help them make the right

[14] https://www.absym-bvas.be/nl/orde/deontologische-aspecten-van-het-gebruik-van-big-data-en-artificiele-intelligentie-voor-biomedosch-onderzoek.

decisions, ease their workload (integrating AI into workflow) and provide knowledge transfer. However, buy-in by professionals will also depend on interesting developments from the user's point of view and not just from the point of view of what is technically possible. At the same time, issues such as legal liability and the risk of biasing the quality of the used data must also be considered. Moreover, AI can increasingly help **citizens** monitor their own health through the many possibilities offered by wearable technologies and health applications for example. For this reason, the opportunities AI offers for healthcare must be promoted.

Belgium is one of the world leaders in biotech and pharmaceuticals[15] [16]. Over the past 10 years, research and development spending has increased by 166%, from €1.9 billion in 2010 to more than €5 billion in 2020. With AI steaming ahead at full speed in this sector and changing the way therapies are developed, Belgium's ability to develop AI expertise in this field will be crucial.

Seizing the opportunities offered by AI requires working with healthcare stakeholders to explore the risks and opportunities of applying algorithms and AI in healthcare, as well as the legal and ethical issues and associated tools.

Belgium could become the European centre for AI in healthcare. The ambition is to deploy reliable, secure, ethical and effective AI in order to:

- **support health professionals in their care task** by ensuring better diagnosis, prevention and disease prediction, and by freeing up time for tasks with high added value such as patient contact
- **improve hospital management** by optimising patient, staff and material flows. This contributes to **optimising** queues, admission capacity and stock management of drugs and surgical materials
- **use real-time information** to deal with public health emergencies and plan long-term healthcare needs
- **reuse health data in a relevant, controlled (patient consent and data anonymization) and secure way** for clinical research and the development of new AI, drugs and therapies in

[15] https://www.premier.be/nl/belgie-de-health-biotech-valley-van-de-toekomst.

[16] https://pharma.be/fr/medias/publications/belgium-the-biopharmaceutical-innovation-hub-in-the-heart-of-europe.

collaboration with hospitals, patient organisations, companies, universities and research centres, and enable the emergence of new technology companies
- **enable people** to take control of their chronic disease by using AI applications on their smartphones and other connected devices
- **improve research and development**, for example by discovering new drugs.

LINES OF ACTION

- promote initiatives to guide healthcare institutions in implementing technologies with high added value (e.g. robotic surgery, image, speech and text recognition, diagnostics support and standardisation of feature protocols and terminology)
- provide training for health professionals and health technology professionals: doctors, pharmacists, biomedical scientists, nurses, physiotherapists, psychologists and engineers need to be trained using adapted programmes within basic courses on digital health and artificial intelligence, but also through upskilling for professionals already active in the labour market
- implement new methods for financing and reimbursing technologies, in consultation with insurance institutions, health insurance funds, patient and professional associations
- adopt effective governance of medical data by 1) generalising FAIR data guidelines across all hospitals and their IT ecosystems, 2) introducing medical terminologies that enable the development of AI and comprehensive analyses (SNOMED CT), 3) identifying opportunities for secondary use of anonymized data for research and development purposes, 4) facilitating patient access to their data
- perform research on the creation of a regulatory platform for AI in medicine that can 1) review technological solutions through appropriate procedures and 2) verify approved solutions once they

have been implemented by tracking products over the long term (and enable continuous improvement) through incident reporting platforms
- bringing together companies, universities, patients, doctors and healthcare providers to define and develop innovative and ambitious health tech and biotech solutions
- coordinate the design, implementation and validation of clinical AI solutions: coordinate the implementation of AI solutions in healthcare institutions and test these solutions through randomised clinical trials and other clinical studies to demonstrate the added value of AI technologies for patients, the hospital and society.

Objective 6 - Serve a more sustainable mobility

Reforming the mobility system is one of the most important challenges of our time. If policies remain unchanged, global demand for urban passenger transport will more than double between 2015 and 2050[17]. A similar trend is also expected for **freight transport**.

These developments come with several challenges. Mobility is at the heart of key societal challenges that need to be addressed. From a social and societal perspective, the increasing demand for mobility is creating challenges in terms of traffic, congestion, road safety and spatial planning. This increasing demand has significant implications for the quality of life, in particular for the environment and public health, due to the impact on air quality (NOx, particulate matter), climate change (greenhouse gas emissions), noise and visual pollution, and the increasing energy footprint of the transport sector. Addressing these challenges requires a proactive mobility policy based on three key principles of a transition to more sustainable mobility: "Avoid – Shift – Improve" (ASI). This means it is important to limit the development of demand for mobility, promote the shift to more sustainable modes of transport and, finally, improve the efficiency of modes of transport.

In this context, the European Union published a detailed report[18], in the last quarter of 2020, outlining the potential of artificial intelligence in the transport sector. This report concluded that AI use is still constrained by poor access to qualitative data. Indeed, access to quality data is necessary for both private and public mobility solution providers, regulators and MaaS solution providers.

[17] Perspectives des transports FIT 2021, OECD, 3. Transport urbain de voyageurs : les villes peuvent rendre la mobilité durable, équitable et résiliente | Perspectives des transports FIT 2021 | OECD iLibrary (oecd-ilibrary.org).

[18] https://www.europarl.europa.eu/RegData/etudes/STUD/2021/662906/IPOL_STU(2021)662906_EN.pdf.

The use of innovative technologies can help us meet our commitments on more sustainable mobility and improve road safety. Artificial intelligence can help detect dangerous situations in traffic (intelligent detection systems for traffic violations, identification of high-accident-risk areas using more effective predictive models, etc.). It can also boost competitiveness by promoting European alternatives for global big-tech companies already operating in Europe.

Our country already provides an attractive platform for logistics activities thanks to the well-developed transport infrastructure and its central location in Western Europe. Under the right conditions, this could also be an area for innovative solutions There is a huge potential for optimisation in the logistics sector that artificial intelligence can certainly contribute to.

Today, mobility must be understood as an integrated and organised field of action, with mechanisms to regulate supply and demand and promote multimodality for all, including in areas less well served by public transport, etc.

The mobility systems of the future need to be intermodal and digital and must promote the use of **more sustainable modes of transport** (walking, cycling, public transport) and the integration of new mobility solutions such as carpooling, car sharing, shared bicycles, "micro-mobility" and self-driving vehicles. With this in mind, it is important that authorities organising transport at the different levels of competence formulate a visionary mobility policy supported by concrete, coordinated mobility plans to ensure that policy is implemented.

Addressing mobility challenges requires a shift to more global and coordinated mobility management and more proactive management of mobility demand – including a reduction of demand, making it possible to influence people's behaviour, for example by avoiding unnecessary trips.

Note that Belgium has committed to reducing its greenhouse gas emissions in non-ETS sectors by 35% by 2030 (compared to 2005) and the transport sector also needs to contribute to these efforts.

Improving air quality is also a crucial challenge, especially in cities. This improvement in air quality should be able to ensure a positive impact on the environment, public health and the quality of life of citizens. Possible strategies to address these challenges include decarbonising the transport sector by providing a modal shift to sustainable transport modes, developing the supply of public transport, reducing vehicle emissions and controlling the demand for (motorised) transport.

LINES OF ACTION
• develop and implement a national vision for "Mobility as a Service" (Maas) and lay the foundations for a "Logistic as a Service" (LaaS) approach, both in consultation with the regions • explore the potential of AI to improve road safety • support the development of logistics optimisation processes • improve the use of data on the mobility of people and goods to support and guide the transition to more efficient, safe, inclusive and sustainable mobility.

Objective 7 - Protect the environment

Artificial intelligence could be used to help solve a number of environmental problems. However, AI is a technology that is very energy-intensive. For this reason it will be important in the future not only to take advantage of the help AI can offer in building a greener economy, but also to reduce the **intrinsic energy impact of AI**. Initiatives already exist at both the national and European levels. These numerous initiatives make the issues concrete and show us the way.

AI algorithms are special because they mimic the human mind by learning from experience rather than using heavy models. The paradigm shift leads to new opportunities to solve certain problems.

Some examples:

- Better weather forecasts can help our **farmers** better plan their crops and even reduce fertiliser consumption
- Using image recognition can help analyse and correlate satellite images to determine evolutions in **biodiversity** or even recognise the omens of natural **disasters**
- Better climate forecasts should allow more realistic simulations. In turn, this would make it possible to optimise investments in **infrastructure**, for example in **smart grids** or **micro grids**[19]
- The ability to predict demand as a function of different contextual parameters should enable the industry to produce goods 'just in time', reduce inventory costs and sometimes reduce waste disposal costs when stocks may spoil
- The ability to analyse massive amounts of textual data should allow us to automatically structure more and more information on the internet, enabling us to extract information about buying behaviour from texts without the need for

[19] https://www.haulogy.net/Solutions/#collective_self_consumption.

comprehensive audits; this would allow us to automatically **assess the ecological footprint** of these different actors
- The computational capacity available today makes it possible to **virtualise** a large number of infrastructures. This has a twofold effect: on the one hand, smaller actors can test services or products on heavy infrastructure without having to finance the construction of these test benches, and on the other hand, this virtualisation avoids the creation and subsequent "disposal" of these test benches (a clear environmental impact). Finally, this computational capacity can be used to develop new materials, also making it easier to simulate their production and estimate their environmental impact even before production starts
- AI's overall contribution to energy model transformation is crucial[20].

However, these opportunities to help ensure a sustainable environment have a downside. The algorithms used require a lot of computing power, often produce a lot of data and sometimes exchange a lot of information over the network. It is assumed that AI servers will consume 10% of all electricity worldwide by 2025[21].

Europe is acutely aware of this and while it recognises the contribution AI can make to the implementation of its Green Deal, the study commissioned by the Special Committee on Artificial Intelligence in a Digital Age (AIDA) also recommends looking at the environmental impacts of AI[22].

LINES OF ACTION
• promote increased use of AI so that industry can reduce its carbon footprint (educate, communicate and innovate)

[20] Study Harnessing Artificial Intelligence to Accelerate the Energy Transition.

[21] https://www.researchgate.net/publication/320225452_Total_Consumer_Power_Consumption_Forecast.

[22] https://www.europarl.europa.eu/RegData/etudes/STUD/2021/662906/IPOL_STU(2021)662906_EN.pdf.

- analyse specifically which disruptions AI can create in different industries and which solutions it can provide within its own industry
- guide industrialists so that they can identify opportunities and help them understand the impact AI tools have on their current business model
- strengthen research and help researchers make their work useful for the economy and increase international visibility. This help for researchers should not be limited to producing prototypes; support (investor platforms) will be needed to scale up prototypes
- develop Belgium's computer and storage infrastructure so that the different actors can test their ideas without having to take data out of Belgium
- ensure that AI contributes to a circular economy in which products, their components and the raw materials they are made from remain in their cycles for as long as possible so that needs can be met with the lowest possible use of materials
- in general, ensure that the use of AI does not lead to an increased ecological footprint.

Objective 8 - Provide better and lifelong training

There is broad consensus that advancing digitisation and the introduction of AI will have profound effects on the labour market. Many jobs will disappear, while other types of jobs will be created. The nature of work will change and require new skills. Temporary mismatches between job requirements and available skills can be expected. Technological development may also be a cause of polarisation in the labour market. Effective coordination with social protection is crucial for a socially responsible digital transition. A number of proposals will need to be evaluated to **develop new skills, promote the emergence of talent and attract potential top employees**. Bringing together all actors in the learning process and the relevant authorities is essential to developing an ambitious long-term plan.

Close monitoring of labour market developments is an important measure to ensure this transition goes smoothly. AI can play a role in responding quickly to job changes and can help government and industry anticipate new training and development needs. A study by the McKinsey Global Institute estimates that between now and 2030, 30% to 40% of tasks will change in 60% of occupations. To compensate for this change, **large-scale** upskilling and reskilling programmes will have to be rolled out and a new "learning deal" will also have to be launched at all levels of education; in addition, an even greater commitment to lifelong learning will be required.

Besides upskilling and reskilling to learn how to work with AI, the impact on employment caused by the implementation of AI in numerous economic sectors must also be taken into account. Indeed, several tasks/low-skilled workers could be taken over/replaced by AI systems. New tasks will not be available for some of these workers. In other words, they will have to receive guidance as part of their vocational progression.

AI can also play a complementary role helping people perform their tasks so that their working conditions improve and the productivity and efficiency of all workers increases, mitigating the negative effects of digitisation on the labour market.

As AI emerges in all economic sectors, demand for IT profiles will increase, and more specifically for profiles with specialisation in AI, collective intelligence, collaborative governance, etc. A new edition of the study, "Be the change", which came out at the end of 2020, argues that Belgium will be able to create 310,000 new jobs between now and 2030 and that most of these profiles will require a lot of digital skills. About 30% should have at least a basic understanding of AI. However, education is currently failing to meet that demand.

Training is therefore an essential part of the strategy. This covers both technical and non-technical aspects.

LINES OF ACTION

- create a framework for upskilling, reskilling and the development of AI basic skills to change or improve people's overall capabilities
- set up a New Learning Deal cycle of foresight workshops called "Bright Mirrors" on the future of work in all its aspects (needs, challenges, risks, opportunities, at the individual and societal levels)
- identify which occupations or jobs are expected to bear the heaviest impact as AI technologies become mainstream so that workers with such an occupation or job can receive appropriate training as a priority with a view to professional advancement
- determine the training and digital skills of the 21st century especially in the field of AI
- stimulate the lifelong learning market by strengthening the continuous learning programmes offered by educational institutions, in view of an ambitious continuing education programme ("Adults Reskilling Programme")

- collective agreements could include provisions for the development of basic AI skills among workers
- set up a Job Market Place, a project aimed at creating and managing a platform that facilitates meetings and exchanges of profile requests and offers between companies, government or non-profit organisations and AI specialists.

Objective 9 - Provide better services and protection to citizens

This national plan aims to position the government as an AI player. Citizens and public sector staff are at the centre of the idea.

Government departments are analysing the potential that AI offers to carry out their tasks. For example, if the public sector uses AI, it can help to:

- provide advice and services that better meet the needs of citizens;
- rationalise processes while also reducing costs (through the joint procurement of AI) and optimising the use of resources, in particular by automating certain repetitive tasks, allowing public service staff to focus on tasks with stronger added human value;
- improve the quality of processes and services through automatic detection of anomalies;
- identify trends and make predictions based on large amounts of data;
- sort and categorise different data, be it text, speech or images;
- in terms of analysis, AI systems could be used to check a person's eligibility for a programme, identify the needs of a target group or perform complex calculations;
- AI systems could come in handy for compliance applications to collect decisions on similar cases, update the applicable regulatory framework or monitor compliance with standards;
- in terms of user interaction, AI systems (e.g. via chatbots) could assist users in preparing their file (pre-filling forms), answer citizens' questions about the allocation of a subsidy or refer citizens to government services.

AI offers numerous benefits for the public sector. In fact, the public sector has already integrated AI in its processes. Indeed, half (56%) of

Belgian government organisations appear to have already implemented AI solutions in their organisation.

So while AI is already a priority for Belgian public services, Belgium would also do well to focus its strategy on using AI to drive growth and create economic benefits.

Efficient labour market policy and social policy driven by AI

AI can also play an important role more specifically in social policy provided the fundamental rights of citizens are respected. The social security sector has been a pioneer in e-governance over the past decades. To make their services more efficient, faster and more user-friendly, the public social security institutions have joined a joint digitisation and automation strategy.

More than 3,000 professional social security actors now exchange data and offer integrated services. More and more social entitlements, subsidies and benefits are granted automatically. AI also plays an important role in this context, especially with a view to reducing non-use of social entitlements (NT - Non-take up).

For decades, open data have brought greater efficiency and effectiveness to social security. After all, it allows data to be reused and linked to other data. The creation of the Crossroads Bank of the Social Security in the early 1990s marked the beginning of the development of a fully automated and secure network for the management and exchange of data between public social security institutions, on the one hand, and between government and the outside world on the other.

Smals vzw was established to support public institutions in the social and health sector with their information management and related matters to promote the delivery of integrated ICT services, with a view to creating economies of scale and synergies. In this respect, Smals plays an important role as a forerunner of modern technological applications such as AI, especially in the social protection sector. Smals is currently organising AI workshops to encourage and demystify thinking about AI.

The aim is to work with institutions to find useful and viable AI cases with the technology and data available today. New steps in the

implementation of AI applications can not only improve the efficiency of social welfare operations and services for citizens, but also make it possible to better satisfy new needs.

LINES OF ACTION

- maintain a dialogue with citizens to identify their needs and concerns and in turn promote social acceptability of AI and facilitate the human-centred development of services (e.g. chatbot as a service)
- inform citizens about the use of AI applications in the federal administration
- help public organisations take advantage of AI when developing their public services (e.g. through monitoring, surveys, maps of the AI landscape, the mapping of existing projects and best practices, international benchmarking, etc.) and this in various fields such as disability in the health insurance system
- foster a culture of innovation and experimentation to accelerate the integration of AI within public services (e.g. through hackathons or by developing spaces for ideation and experimentation, etc.)
- develop the right AI skills within public services by focusing on talent management and developing skills adapted to the disruptive nature of AI
- make data accessible and usable for AI systems and vice versa (e.g. by ensuring interoperability of developed systems, etc.)
- Provide a framework for AI design and use through guidelines on ethics, safety and sustainability adapted to AI (e.g. by considering data protection, helping public administrations integrate ethical issues in the design of services and during their development, encouraging best practices aimed at reuse and sustainability, etc.)
- development and implementation of AI applications to support processing and checks in the administrative processes of the social protection sector
- development and implementation of AI applications to support the information and services provided to citizens

in the social protection sector, taking into account the reality of the digital divide
- Develop AI applications to ensure citizens' social rights and to detect new needs more effectively and faster
- implement AI applications in consultation with the relevant administrations and stakeholders to improve access to social protection and combat non-take up
- make the labour market and social protection Data Warehouse a high-performance data infrastructure for AI to enable the labour market and social policy to respond quickly to developments and trends.

Implementation & Governance

Description of the assignments of the FPS BOSA and its AI4Belgium programme, and the assignments of the FPS Economy

In March 2019, the **FPS BOSA** and several partners (Agoria, Be Central, The Beacon, AI Network, BNVKI) launched the AI4Belgium coalition on the occasion of the presentation of the federal government's first AI strategy (also called AI4Belgium). Since then, many other actors have joined or collaborated on the initiative. Examples include the institute TRAIL (Trusted AI Lab), the Knowledge Centre Data & Society, the Flemish AI Academy and the institute FARI – AI for The Common Good. This strategy was sent to Europe as part of the coordinated European AI plan. The FPS BOSA coordinates, is responsible for budgetary monitoring and ensures integration with existing initiatives at the federal level and, insofar as possible, at the decentralised level. Indeed, national AI coalitions, which bring together regional ecosystems, already exist in most European countries.

The FPS BOSA and the **AI4Belgium programme** are responsible for developing the AI4Belgium coalition, which aims to bring together AI actors and initiatives in Belgium as much as possible. This coalition wants to ensure that Belgian citizens and organisations maximise the opportunities offered by artificial intelligence and seeks to facilitate the transition in a responsible way.

The aim of AI4Belgium within the FPS BOSA is to coordinate the Belgian ecosystem of AI actors according to a quadruple helix model (academia, the public sector, the private sector, civil society). This type of organisation has amply proven that it is cut out to increase the potential available in innovative ecosystems even more by bringing together different types of actors and helping to foster partnerships between regions while supporting their own strategies. The overriding objective is to put Belgium, including its regions, on

the European and international AI map and help Belgium continue to progress in this field.

The role of the AI4Belgium programme within the FPS BOSA includes:

- managing the implementation of the federal plan;
- acting as an AI observatory for Belgium, carrying out surveys and creating AI landscapes by conducting research proactively;
- providing techno-economic monitoring of international AI trends and disseminate it;
- helping define the federal government's strategy;
- stimulating, creating and supporting synergies with the federated states;
- maintaining and making available a federal agenda of AI-related activities;
- acting as a technical consultation platform for the actors of the Belgian quadruple helix, especially for consultations by international organisations, and as such contributing to the considerations that occur before Belgium defines its positions;
- acting as the "National Contact Point" for the AI4EU platform and other similar international initiatives;
- acting as a hub and connecting different actors on a daily basis to realise their project (research related to technical, scientific or commercial skills);
- providing information on funding opportunities, especially through European projects;
- organising thematic working groups at the national level, and as such helping to ensure that experience is shared widely among actors and that the main current challenges for Belgium are identified;
- organising communications.

On the other hand, the **FPS Economy** is tasked with providing the levers for an efficient, competitive and sustainable economy and supporting our country's economic growth. The FPS Economy participates in economic policy and contributes to the creation of a modern legal framework for the Belgian economy, taking into account the institutional, European and international context. Consumer and business protection, with a special focus on SMEs, is central to this approach.

Within the framework of the #Smart AI Nation plan, the assignments of the FPS Economy are reflected in many ways, notably through the elaboration of regulations in the field of the digital economy, through the coordination of the Belgian position in negotiations regarding the EU Digital Agenda, in particular regarding the draft EU regulation on AI through support programmes for the digitisation of companies, and digital inclusion through the preparation of the strategy for the development of a data economy. The FPS Economy is also in charge of key areas for the implementation of this national plan, in particular consumer protection, standardisation, accreditation through BELAC of certification bodies that will play an important role in AI, and intellectual property.

Finally, as indicated under objective 4, an efficient infrastructure, especially in the field of telecommunications, will play a key role in the development of AI.

General structure of the organisation

To guide the implementation of this national plan, a joint **Steering Committee** has been created by the FPS BOSA and the FPS Economy consisting of 12 members, 6 French-speaking and 6 Dutch-speaking including:

- 1 representative of the minister or state secretary who is responsible at the federal level for digitisation
- 1 representative of the minister responsible for economy
- 1 representative of the minister responsible for telecommunications
- 1 representative of the FPS BOSA
- 1 representative of the FPS Economy
- 2 university representatives (1 Dutch-speaking and 1 French-speaking)
- 2 representatives of the National Labour Council (1 Dutch-speaking and 1 French-speaking)
- 1 representative of the OISZ
- 1 representative of the BIPT
- 1 representative of the CCB

The federated entities may appoint a representative to participate as an observer.

Maximum two-thirds of the Steering Committee members have the same gender.

The Steering Committee is chaired by the Director-General of DG Simplification and Digitisation of the FPS BOSA. In the Director-General is absent, the Steering Committee is chaired by the representative of the minister or state secretary responsible for digitisation.

The Steering Committee is responsible for preparing the annual work programme. It approves the annual report, presents its internal regulations and may formulate proposals on the functioning of the AI programme.

To reduce the number of authorities involved and ensure a coherent approach in this respect, the Steering Committee will act as a single point of contact at the federal level for AI-related issues. If deemed necessary, the Steering Committee may establish a subgroup with a mixed composition (policy committee members and external members).

The Steering Committee meets at least three times a year, at regular I
intervals.

The members of the Steering Committee are appointed by ministerial decree which is co-signed by the minister or state secretary responsible for digitisation, the minister responsible for the economy and the minister responsible for telecommunications.