DIGITIZING BELGIUM

HOW BELGIUM CAN DRIVE AND BENEFIT FROM AN ACCELERATED DIGITIZED ECONOMY IN EUROPE





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EMANUELLE ALM

NICLAS COLLIANDER

FILIEP DEFORCHE

FREDRIK LIND

VILLE STOHNE

OLOF SUNDSTRÖM



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EXECUTIVE SUMMARY

BELGIUM MUST MAKE FASTER and broader digitization a national top priority. It is essential for the country in order to secure future GDP growth and the creation of new jobs, as well as to stay competitive in a global and increasingly digital world.

Digitization is significantly influencing our lives and our economies. It represents a transformative shift in technology – influencing governments and businesses, as well as individuals. Not only does it enable increased efficiency and globalization, but it also changes how existing businesses operate and how markets are opened up, and it greatly affects our everyday lives. Embracing digitization, and staying abreast of it, is key to keeping up global competitiveness.

Although Belgium has lately shown high ambitions to promote digitization and has been improving its digital performance, there is still room for improvement if it is to become a top digital EU nation.

- In the Digital Economy and Society Index (published yearly by the EU Commission), Belgium is ranked 5th out of 28 countries, however.
- In the 2016, BCG e-Intensity index, which measures to what extent a country embraces the Internet, Belgium ranked number 19 out of 85 countries. This is far behind several European countries. Denmark is ranked 4th, and the Netherlands is 5th.
- The story is similar when we look at the 2015 Global Innovation Index, where Belgium is ranked 25th out of 141 countries, or 16th if we only consider European countries (in contrast to the Netherlands at number four).
- Moreover, Belgium is ranked only 17th out of 70 countries in the world in English proficiency. This may reduce the attractiveness of

Belgium as an international magnet for talent and also make Belgian companies less adapted to a globalizing world where English is a main language.

- Belgium is also ranked 15th in the Forbes ranking of best countries for business, behind many of its European peers (such as Denmark, Norway, Sweden, Finland, and the Netherlands; ranked one, three, five, six, and nine respectively).
- Lastly, in 2014, venture capital investments as share of GDP were 0.32% behind Denmark, Finland, Sweden, and the UK. That said, there are signs of a significant increase in VC activity in Belgium at the moment, with Q2 2016 funding in excess of €100 million, more than double the amount in the same period last year.

Furthermore, the current digitization trajectory in Europe is not sufficient. The ongoing initiative of the Digital Single Market is not enough to fully capture the digital opportunity for Europe, especially when considering the speed of change outside the continent, notably some rapidly digitizing Asian economies.

- The EU DSM plan is broad, which risks a lack of prioritization. As a result, progress on key areas of opportunity, such as the removal of obstacles to small businesses expanding into European markets, is unlikely to be fast enough. In addition, the DSM plan contains many proposals for new legislation and regulation where the use of a wider set of policy tools, such as self-regulation, might allow for more flexible and quicker solutions to be developed.
- Looking outside of Europe, there are several other nations, particularly in Asia, that are highly digitized or are undergoing rapid digitization, including Hong Kong, China, Taiwan, and South Korea. There is a risk that European countries, including Belgium, will be surpassed by these more digitally inclined economies, leaving the EU in a digital backwater on the global scene, with capital, talent, and growth at risk of being focused elsewhere when large international digital players shift their focus to more attractive markets.

The value at stake for Belgium of a fully working Digital Single Market and full embrace of emerging digital could potentially be translated to more than 300,000 FTEs and a doubling of GDP growth rate by 2020. Also, there are significant positive values to society beyond those measured in jobs and GDP, such as improved products and services to citizens, and better access to information.

• National digital efforts allowing Belgium to eventually fully embrace a set of emerging high-value digital industries, such as Artificial Intelligence, big data analytics, the Internet of Things, mobile and cloud computing, advanced robotics, and virtual and augmented reality, could increase the country's GDP growth rate by around 50% through 2020. Moreover, a fully working DSM could increase the GDP growth rate in Belgium by a similar amount on top of that.

- An increased level of digitization combined with a working DSM could thus amount to doubling of GDP growth for Belgium. This is equal to an approximately €45 billion increase in GDP by 2020, compared with the current trajectory
- Translating these figures into job opportunities, we find that the total value at stake for Belgium could exceed 300,000 FTE positions by 2020. These things combined create an opportunity Belgium cannot afford to miss.

To fully capture the value of digitization, we believe that a broader blueprint for digital should be adopted in Belgium. However, when it comes to near-term prioritization, Belgium should focus its efforts on following through strongly on the government's current digital agenda and its goal to be among the EU's top three digital countries.

Focus on encouraging and promoting digital entrepreneurship and digitization of both SMEs and larger businesses. The view on risk when it comes to starting a new business and scaling up using digital, as well as adopting innovative digital solutions for existing SMEs, must be revised. This is also applicable for larger organizations. It's not easy to change a culture, but Belgium's comparatively conservative mindset when it comes to entrepreneurship and going digital must be addressed. Measures to drive change in the culture could include promoting digital champions and innovation via national competitions, educating SMEs on how to use open public data, increasing labor market flexibility, and steering public tenders toward SMEs. Government digitization could also be used to create a pull effect, for example via tax returns. The importance of digitization of SMEs for competitive growth in exports should also be further highlighted and promoted in the SME community.

Updating primary and secondary educational curricula and introducing national workforce planning. Belgium is falling behind in terms of STEM and digital skills in the labor force. Discussions are not leading to concrete decisions and the implementation is not fast enough. The Belgian Alliance for Digital Skills and Jobs is a good initiative – also involving the private sector in the process - but concrete measures must be taken to ensure that decisions are made and actually implemented. Decisions and initiatives at the federal level must be translated into buy-in, and urgent action is required on the regional level, where educational initiatives are ultimately decided upon. To facilitate this process, and at the same time work to minimize the national gap in digital skills, national workforce planning can be introduced, where regions are invited to participate in the process and also sign up to be responsible for delivering the skill supply to meet targets. Curricula should also be revised regularly and proactively to fit the digital era.

Attracting international capital. Given Belgium's small size and limited current investment capital, it is important to prioritize measures to attract international capital. This could either come in the form of attracting international top investment funds or creating new funds

whose investment capacity is larger than current public alternatives – such as by collaborating with other nations in the region to set up a common fund. In both cases, Belgium would need to clearly communicate the benefits of investing in the nation's businesses.

In addition, it is crucial to ensure a continued strong and inspiring political leadership communicating urgent need for change, as well as an improved alignment of the national/regional plans in Belgium.

To fuel further digitization as well as achieve a truly digital single market in the EU, Belgium should also engage in cross-European collaboration with likeminded peers to push digital development in Europe. This is more important than ever, given the Brexit situation. The emerging digital economy is likely one of the major growth opportunities remaining for the continent, and the smart adoption of policies to enable this could bring a lot of value to Belgium and Europe. Pushing the digitization of Belgium is worth immense attention and effort.

IMPACT OF DIGITIZATION

S OME OF THE TECHNOLOGICAL shifts that are driving ongoing digitization are the Internet of Things (IoT), which enables connectivity of a vast array of objects, and remote monitoring and control through online platforms, as well as big data analytics, advanced robotics, and new forms of visualization through augmented and virtual reality.

Values created for citizens, businesses, and

nations. Digitization creates value for individuals, corporations, and society alike. On the corporate side, it can expand reachable markets for companies both domestically and internationally, thus increasing sales potential. Businesses also benefit from the productivity increase that comes with digitization of corporate processes, for instance in digitized supply chains, automated production lines, and digitized distribution systems for customer deliveries.

Going digital can help governments increase their overall efficiency, for example through productivity increases in tax collection and data management. E-government initiatives and big data tools open up the possibility of analyzing societal trends as well as combating fraud and misuse of public services. Increasing access to non-sensitive government data through e-government services may also boost innovation in the private sector by encouraging new uses of public data. Citizens will benefit from the increased competition digitization will engender, giving them access to the best products and services at the lowest price. More competition would also push European companies to improve their products and service offerings, and consequently their competitiveness. Companies, citizens, and society as a whole gain from a more open job market with digitized recruitment, where supply and demand are more efficiently matched and trained and talented people fill the new positions. This could contribute to reduced unemployment provided people with the right competencies are available to fill the vacant positions.

What this means for the Belgian government and companies. Digitization brings about rapid shifts that can cause abrupt turns in its path, giving rise to considerable uncertainty. In many cases, the technologies and services are at an early stage, so it's difficult to foresee their impact. This complicates planning for the long term and making informed decisions, but this is not a reason to remain indecisive or passive.

Although policy solutions are often not clear, there are many possible options to consider. The Belgian government should therefore engage in an open, proactive, and solution-oriented debate with stakeholders. The same goes for companies when they make decisions related to their digitization journeys. The earlier this takes place, the more time there is to adjust helping the most vulnerable members of society take part in and profit from this transition.

In cases of uncertainty, a degree of risk will be involved in making decisions, but risk should be spread out where possible. Assessing and then trying different options continuously and with an open mind makes for more nimble organizations with more informed and skilled workers, facilitating a change of course for governments and companies when (not if) it is needed. This will allow Belgium to stay competitive from a digital perspective, to help develop local skills needed for the future, and to lay the foundation for more informed policy-making.

THE BURNING PLATFORM WHY BELGIUM NEEDS TO DIGITIZE FASTER

DIGITIZATION CONSTITUTES A TRANSFOR-MATIVE shift in technology that fundamentally influences all industries and society in general. It is not an isolated phenomenon but an integrated part of the economy as a whole. And digitization doesn't only transform existing industries, it gives rise to new ones. It constitutes a great opportunity to boost the Belgian economy through new jobs and overall GDP growth if the country plays its cards right.

Belgium has been improving in digital ambition and performance over the last years, but there is still room for improvement in order for it to become a top digital EU nation. The country should strive to become one of the top three countries in Europe. Despite several bright spots on the horizon - most notably with initiatives from the government such as setting up a Ministry for Digital Agenda, the Digital Belgium plan (the country's digital agenda), and the Digital Tour that aims at getting more SMEs online (the "Tournée Digitale") - Belgium needs to take further action in order to become a top three EU digital nation. This includes better alignment, and reinforcement-rather than competition-of regional plans, such as Walloon Conseil du Digital of Marcourt and the e-commerce plan of Muyters. Given the rapid pace of digital evolution there is a risk that Belgium will be left behind as other nations digitize more quickly. The consequences of failing to keep

up could be harsh. Combined with globalization, increased digitization gives rise to a race for competitiveness. If existing and new innovative Belgian companies cannot be globally competitive, the country's GDP growth and jobs are at stake in the long term. Of the 43,000 jobs added in Belgium in 2016, the majority are in digital – according to the Belgian National Council on Employment.

Studying a number of metrics covering digitization, innovation, and business climate, Belgium scores lower than some of its European peers. In the Digital Economy and Society Index (published yearly by the EU Commission), Belgium is ranked 5th out of 28 countries. For instance, Belgium ranked 19th overall out of 85 countries in the 2016 BCG e-Industry index that measures the extent to which a country embraces the Internet. This is behind several other European countries such as the Netherlands at number five. To understand this, it is helpful to consider, one at a time, the three components that make up the index: enablement, expenditure, and engagement. Enablement measures how extensive the Internet infrastructure is and how available Internet access is. Expenditure looks into e-commerce and online ad spend. And engagement measures to what extent the government, businesses, and consumers are embracing the Internet. Belgium ranks around the 20 mark for most categories, meaning that efforts are needed in all areas of digitization. A particular area of concern for Belgium is the low level of business engagement – the country is ranked 30th.

The story is similar for the 2015 Global Innovation index where Belgium is ranked 25th out of 141 countries or 16th if we only consider countries in Europe. Innovation is important both for improving existing companies and business models and for coming up with entirely new ones that can compete globally and increase Belgian exports. Moreover, Belgium is ranked 17th out of 70 countries in the world in English proficiency. This low ranking may reduce the attractiveness of Belgium as an international magnet for talent and also make Belgian companies less adapted to a globalizing world where English is a main language. Attracting talent is especially important in times when many countries, including Belgium, see a shortage of ICT professionals that will only worsen as digitization of all industries accelerates.

Belgium needs to drive an agenda to open up European and global markets and accelerate digitization nationally.

When it comes to the private sector, Belgium ranked 15th in the Forbes ranking of best countries for business, behind many of its European peers (such as Denmark, Norway, Sweden, Finland, and the Netherlands; ranked one, three, five, six, and nine respectively). Furthermore, the country is not known as a startup destination and has no unicorns (private companies valued at more than \$1 billion). One reason for this relatively low ranking is the lack of sufficiently large venture capital funds in the country. In 2014, venture capital investments as share of GDP were 0.32% - behind Denmark, Finland, Sweden, and the UK. Not only is venture capital not available in great abundance, but the individual investments are typically small - below €15 million with few exceptions. Out of the 20 biggest funding rounds in Europe in 2014, none of the companies was Belgian, according to tech.eu. The same can be said for

rounds in the first half of 2015, which were dominated by British and German companies, with representation by Swedish, Icelandic, Israeli, and French companies. That said, there are signs of a significant increase in VC activity in Belgium at the moment, with Q2 2016 funding in excess of €100 million; more than double the amount in the same period last year. Also, the number of funding rounds are increasing rapidly, a sign of a rapid development of the country's tech scene.

As the country is small, a consolidated venture capital market involving Belgium and other countries in the Northern European region would be a way to increase access to venture capital and allow for bigger individual funding rounds. This is important in order for Belgium to cater to the needs of tech companies that have the potential to go global and grow big.

Rising tiger economies. Shifting the perspective to the world outside Europe further underlines the critical nature of Belgian action in terms of accelerated digitization. Belgium is a small country and cannot rely on its internal market for growth. This means that for Belgian companies to grow big, they will inevitably need access to markets outside the country to reach a globally competitive scale. They could even benefit from taking the extreme view that there is no significant local market to address, and therefore direct all efforts to exporting. Belgium has to embrace open market initiatives to make sure its companies can be competitive and ensure long-term growth and Belgian jobs.

The risk to global competitiveness for Belgian companies is twofold. Not only will they fail to increase market share outside of Belgium, they also risk being overtaken in their home market by players such as their Dutch neighbors. Therefore, Belgium needs to not only drive an agenda to open up the European and global markets, but also to adapt its national policies to accelerate digitization of its companies and its population. The former may be impeded by forces which consider initiatives to increase the pace of digitization to be a threat to existing business models and structures. Belgium should work against such forces as there is great value at stake. There are also countries outside Europe that have reached a higher rate of digitization than Belgium (such as South Korea, the US, Hong Kong, Taiwan, Japan, Singapore, and New Zealand – if we look at the BCG e-Intensity index) and others that will overtake it if Belgium does not accelerate its digitization efforts.

The Internet will contribute less to the Belgian economy than it does to the Chinese economy by 2016–2017.

Looking at the Internet's contribution to GDP shows that Belgium's 5.2% in 2014 puts it behind many of its small European peers. Belgium is well behind the UK and only marginally ahead of Germany and France. Comparing Belgium against China raises further concerns, as China is predicted to surpass Belgium in 2016 or 2017 in terms of the Internet's contribution to the economy. China's rapid growth, along with Belgium's average position within the group of digital frontrunners in Europe shows that Belgium needs to increase its digitization efforts considerably in order to catch up with leading nations and become competitive in the evolving global digitized economy. Failure to act now will put Belgian companies' competitiveness at risk, which could adversely affect the country's GDP growth and available jobs in the long term (see Exhibit 1).

This picture holds true when we consider the non-economic factors covered by the BCG e-Intensity index. In 2016 Belgium was ranked 19th – one up from its rank in 2011. Belgium is not gaining ground. While Belgium remains an average performer, other countries (for example some Asian nations) are digitizing considerably faster. Extrapolations show that Belgium will be overtaken by China before 2020 and is already behind other Asian countries such as South Korea, Singapore, Taiwan, and Hong Kong. As we near 2025, Belgium is projected to climb six posi-



EXHIBIT 1 | e-GDP, China Will Soon Overtake Belgium If Current Trajectory Continues

Note: *Ireland's ICT exports are contributing to the country's high e-GDP share and these exports have been adjusted downward to account for this. Irish ICT services exports have been adjusted downward. In the estimates, average exchange rate for period 2010-2015 has been used to avoid distortions affecting countries to varying degrees. CAGR, i.e. yearly growth figures, are based on absolute market size. **Source:** BCG Analysis, Gartner, Ovum, EIU, Euromonitor, UN, IDC, WTO tions if current trajectories are maintained, but it should aim for considerably more (see Exhibit 2).

Fully embracing emerging high-tech digital industries could increase the Belgian growth rate by 106%.

Digitization and globalization will increase competition both in global and local markets. Belgium is under pressure to increase both digitization and the competitiveness of its companies so that it will not lose out in its home market and, crucially, will have a good chance at increasing its market share internationally and contributing through more jobs and higher tax revenue. To succeed, Belgium has to prioritize digitization measures overall and increase its efforts in order to catch up with digital leaders. The longer the country remains idle, the harder it will become to close the gap. The large values at stake. Digitization will be a main driver for innovation and economic growth for the near and midterm future. This is why Belgium needs to focus on maximizing its efforts on enabling it.

If Belgium successfully constructs a regulatory environment domestically – and pushes for one on the EU level – that promotes fast digitization and innovation, it can expect large economic and societal benefits.

In order to understand the value of an open Digital Single Market and increased digitization to the Belgian economy, we also need to understand the value on a European level. On the EU level, the DSM strategy was presented by the EU Commission in 2015. It is also important to note that the DSM strategy is in no way a complete and ready-made structure that will achieve a fully functioning European single market. As Günther Oettinger, EU Commissioner for the Digital Economy and Society said, "The EU makes progress, but too slowly. There is no room for complacency."

EXHIBIT 2 | Several Asian countries are already ahead of Belgium



Note: 2020 and 2025 rankings are based on extrapolating 2011-2016 data. China 2020 figures linear 2016-20 Luxembourg not included in BCG e-Intensity Index.

Source: BCG analysis, BCG e-intensity index

A working European DSM would bring increases in productivity derived from increased competition and a larger initial market for small businesses and startups. This is especially important to Belgium, given its private sector tilt toward SMEs. It would also enable European consumers to more easily find the best product or service at a better price point.

The value of a fully implemented DSM has been estimated by Cambridge Econometrics to be €415 billion in incremental GDP for the EU member states by 2020. Based on our belief that smaller, more digitized, and exportdependent countries will be able to benefit to a greater extent from a functioning DSM, we have found that the Belgian economy would see a substantial increase in growth. A working DSM would increase the Belgian GDP growth rate by around 53% in the period until 2020 (see Exhibit 3).

The benefits of digital markets and technology are by no means limited to the EU DSM strategy. There are several high-value industries on the rise that can bring significant economic benefit to those ready to take part. Notable examples include technologies often related to Industry 4.0, comprising big data analytics, the Internet of Things, advanced robotics, and augmented reality (see Exhibit 4). Being able to compete in these industries requires innovative businesses that are highly





The Europe Big 5 nations see an ~18% increase in growth rate on average which amounts to a 0.35 pp. higher growth rate.

Belgium sees an ~53% increase in growth rate which amounts to a 0.8 pp. higher growth rate on average.

Source: BCG analysis, Eurostat, OECD, World bank

EXHIBIT 4 | Emerging Global Technology Markets



¹Estimates based on several sources, IDC, Gartner, Markets & Markets, IBM Source: BCG analysis, World bank, Eurostat, IDC, Gartner, Markets & Markets, IBM

EXHIBIT 5 | Digital single market and world-class digitization, further potential for increased economic growth



digitized and that are acting in an innovation-friendly regulatory environment.

Modeling the impact of a full Belgian embrace of these high-value emerging digital industries in terms of increased GDP growth and changes to employment, we find that, on top of the benefits of a working DSM, Belgium's growth rate can increase by another 55% or so. This means that a working DSM combined with an increased level of digitization would amount to a 106% increase in GDP growth rate for Belgium. This is equal to a €45 billion higher GDP by 2020, and would place Belgium among the faster growing economies in Europe. Belgium indeed has a lot to gain from gaining access to a larger digitized market and new technologies (see Exhibit 5).

Translating these figures into job opportunities, we find that the total value at stake for Belgium could exceed 300,000 full-time equivalent (FTE) positions by 2020, more than 2.5% of the current total population. It is also important to remember that the value to society of increased digitization is more than just jobs and GDP. New and improved products and services, and better access to information (for example Wikipedia) has value beyond the jobs created and the direct economic impact. Combined this is an opportunity Belgium cannot afford to miss.

SHAPING BELGIAN POLICY FOR THE DIGITAL ERA

W^E BELIEVE THAT BELGIUM should aspire to become one of the best countries in the world when it comes to leveraging digitization and technology, in order to stimulate economic growth and accelerate current efforts. In this chapter, we suggest a general blueprint for world-class digitization, and measure Belgium's current adopted initiatives and status against it. We then point to areas where we think there is potential to fill gaps in the blueprint.

We also present, for inspiration, some examples of worldwide best practices when it comes to specific initiatives for digitization.

Belgium's adopted digital agenda and cross-departmental governance structure as well as the "Digital Belgium" plan for digitization is a good base for a continued focus on digital, and a step in the right direction, but we believe there is more to be done to keep up with a quickly digitizing world. In addition, it is pivotal to ensure a continued focus by political leadership communicating urgent need for change, as well as an improved alignment of the national/regional plans in Belgium.

Blueprint for national digital agenda. Belgium should strive to become a global leader for leveraging digitization and technology. We believe that nations ultimately must adopt comprehensive nationwide digital agendas to keep up with the fast development of digital. Such an agenda should include a wide set of highly prioritized political policy initiatives and investments for a digitized economy for the present and future. To make sure a digital agenda can be successfully implemented, the agenda must also be underpinned by an efficient structure and a clear leadership.

There are five areas that should be prioritized for a world-class digitized nation. These are:

- Enable digital and technology innovation
- Stimulate entrepreneurship
- Improve access to capital for young businesses
- Adopt and implement smart regulation for the future
- Build the skills and talent of tomorrow

Six main building blocks that are key to successful implementation are:

- A strong and inspiring political leadership communicating urgent need for change
- A cross-departmental government structure
- Alignment of initiatives, targets, and roadmap

- Cross-political-party and regional responsibility and support
- Public-private partnership models
- International peer group cooperation

The priorities and implementation building blocks together form what we see as a blueprint for an ambitious agenda for world-class digitization of a country. We believe that these two parts can be described as "what" and "how." The agenda covers the "what" and concerns prioritizing the right things. The implementation elements to consider make up the "how" and concern how to enable successful implementation of the priorities (see Exhibit 6).

The What – Prioritizing the right things

• Enable digital and technology innovation. Digital and technology innovation require strong support to be in place in several areas. This includes supporting the development of innovation clusters by providing a world-class digital infrastructure and environment (such as a hub for tech), both fixed, where Belgium is strong,

and mobile, where the country is weaker, connecting startups to leading national companies and universities, and attracting the most creative digital minds and leading technology multinational corporations to establish national operations. We also need to steer and incentivize established SMEs – as well as larger companies - to move into digital and mobile-first businesses. Additionally, government processes and services should be fully digitized, and very importantly – these services should be used frequently to boost actual efficiency. Investment is needed in maturing technologies with a high impact, such as IoT and big data. Belgium should also push for – and make sure to be part of – the establishment of international standards for new technologies such as IoT and 5G. Finally, it's time to look into setting a date for a transition to exclusive use of electronic money.

• Stimulate entrepreneurship. Stimulating entrepreneurship is about incentivizing and removing barriers. Taxation should favor, not discourage startups, and public tenders and procurement should be directed toward SMEs to stimulate demand and growth, while initiatives



EXHIBIT 6 Assessment against blueprint for digitization: Belgium is showing strength in leadership and prioritization of digital agenda, but several areas for improvement have been identified

should be put in place to strengthen the link between universities and startup communities to ensure startups have access to talent. Furthermore, it's important to encourage a culture in which entrepreneurship is seen as a viable career option for top talent in order to address societal and cultural barriers to entrepreneurship.

Belgium must invest in maturing technologies with high impact, such as IoT and big data.

- *Improve access to capital.* Despite available public funding, systems are often complex and funds might be partially misdirected. We see that there are several complementary initiatives to be leveraged to enable startups' access to capital. First, public funding structures can be made simpler and the funding should primarily be used for matching private investments, rather than being distributed through publicly run investment firms. Secondly, introducing tax breaks on angel investments, such as the Belgium tax shelter for startups, would give startups access to early-stage capital, incentivizing investors to make less risky investments by allowing potential losses to be offset against income or capital gains. Third, a nation should aim to attract worldwide leading venture-capital funds to the region.
- Smart regulation for the future. There must be a pragmatic and proactive approach to regulation to maintain competitiveness in a constantly changing world. Regulation cannot be allowed to hinder or slow down economic, technological, and societal development. Removing regulatory barriers includes increasing labor market flexibility, simplifying legal conditions for SMEs, and promoting the sharing economy – for example when it comes to car sharing, accommodations, development of new technologies, and music and video streaming. It also includes modernizing

current legislation on intellectual property and data protection to ensure the fullest possible promotion of innovation and transparency.

Build the skills and talent of tomorrow. A central factor for managing unemployment and driving economic growth will be a nation's ability to transform human capital in the face of rapid technological development and to build skills and talent for the future. To manage the next wave of structural transformation successfully, the educational system needs to be rethought. For primary and secondary school, Belgium must modernize the curriculum, including increasing focus on STEM and promoting equity and integration across schools and students. Belgium must also differentiate and specialize tertiary education, and introduce crossdisciplinary programs. Nationwide planning for the digital workforce is needed – looking at future demand in the private and public sectors. To attract international talent, dedicated and functioning talent-visa programs should be in place. Lastly, "relocation packages" can be introduced to minimize existing barriers to relocation. These could, for example, include access to affordable housing.

The How – Enable successful implementation of priorities

- Strong and inspiring political leadership communicating urgent need for change and driving a transformation with a clear agenda and roadmap. Placing digital among top political priorities, promoted by senior ministers, is crucial for achieving worldclass, nationwide digitization. It is also important to make sure there is a clear agenda and an implementation plan spanning multiple years, which can be tracked and communicated to all stakeholders. Belgian leadership must be inspiring and ensure buy-in at the regional level.
- *Cross-departmental governance structure.* To ensure a successful implementation of the new digital agenda, Belgium needs a

strong cross-departmental governance structure. This implies a supervising governing body with the mandate to make central decisions regarding the implementation of the digital agenda, such as we see today in Belgium. The governing body should ultimately be led by a digital minister – an appointed senior minister whose main responsibility is to ultimately drive the digital agenda and its execution. It is in the country's best interest to ensure this structure will last.

- Alignment of initiatives, targets, and road*map.* A highly developed digital agenda must be supported by concise and precisely described initiatives, including specific targets and implementation plans. Linked to the strategic priorities above, an overall implementation roadmap is needed for the digital agenda. The initiatives, targets, and plan need to be communicated and easily available to all stakeholders to educate them on the digital priorities, available support, and new opportunities that might arise. A critical success factor for corporations that undergo transformations and large-scale change efforts is the establishment of a program management office (PMO). The PMO is set up to track, support, and eliminate bottlenecks. A comprehensive digital transformation roadmap would benefit from a similar approach.
- *Cross-political-party and regional responsibility and support.* To ensure successful long-term implementation, the agenda requires cross-political and cross-regional alignment and support. This would allow for continued execution and progress over election cycles, with limited distortion.
- Public-private partnership models. Public-private partnership models will act as a catalyst and support the development of digital in the private sector. Belgium should create structures for joint investments in tech industries, as well as digital advisory boards, which can assist businesses in the digitization effort.
- *International peer group cooperation.* To ensure that we learn from the best

countries around the world, Belgium should make sure to benchmark the progress of digital agendas, compared with other nations. To get an outside-in perspective on the strategic priorities, experts from countries leveraging digitization to drive economic and societal development could be invited to give their input. The gathered input should then be translated into an actionable business plan for each country, with solutions tailored to the individual nation's situation and needs.

A critical success factor is the establishment of a program management office (PMO).

Inspirational global best practices. To give some flavor to different parts of our proposed blueprint, we have gathered a few initiatives and policies for promoting digitization from around the world to serve as inspiration for Belgium.

- Digital enablement: e-citizenship in Estonia. • Led by Estonia's Chief Information Officer and tech-savvy government, e-citizenship has been introduced to boost Estonia's economy by encouraging foreign entrepreneurs to start businesses remotely in the country. An e-residency does not automatically entitle people to physical residency in Estonia, but it allows them to manage an online business and to base their online financials in Estonia. In 2015, the Estonian government took e-citizenship to the next level by partnering with Bitnation, a decentralized governance project offering e-world citizenship IDs and DIY governance. The e-citizens of Estonia will, via Bitnation, be offered the service of notary public. This will allow them to notarize contracts, certificates, and marriages using blockchain technology. The notarization is legally binding in the jurisdiction of the blockchain, rather than in Estonia.
- Smart regulation for the future: New IP act to modernize businesses' IP protection in the

United Kingdom. The UK enacted a new Intellectual Property act at the end of 2015. It is designed to make it easier for the UK to implement the United Patent Court Agreement. It also protects designs and pre-publication research in order to encourage publication of internationally competitive work.

Digitization of government services is underway, but implementation must speed up to reach the level of world-leading nations.

- Stimulating entrepreneurship by linking • education and technology industries via a dedicated body, thus supporting the skills and talent of tomorrow: Promoting semiconductor-related fields in Taiwan. Taiwan's dominance in the semiconductor industry rests on public sector intervention. Since the 1970's, the Taiwanese government has invested in growing semiconductor production through the non-profit Industrial Technology Research Institute. The institute helps students understand and become involved in activities related to the semiconductor industry early on to boost interest in such careers.
- Enabling digital and technology innovation via public-private partnership models: 5G investments in South Korea. South Korea is positioning 5G to become a core driver of its future growth by public-private partnering and SME involvement. The government has pledged to invest \$1.5 billion – along with the private sector – in R&D, bandwidth, and a business ecosystem. Unlike their earlier investments in 4G, this time the government will intentionally increase support for startups and SMEs – hoping to increase SME participation in 5G research by 40%.
- Increasing labor market flexibility: Flexicurity model of Denmark: Denmark stands out when it comes to labor market flexibility.

Denmark's employment regulation is regarded as one of the most flexible in the world thanks to its "Flexicurity" model coupled with an active labor market policy. The Danish model consists of three elements – flexibility, security, and an active labor market policy, sometimes referred to as the "golden triangle." The elements ensure flexibility around hiring and firing, unemployment security and high unemployment benefits, and jobsearch guidance or education.

Assessment of current ambitions and policies. Using the previously described blueprint, consisting of the elements making up the "what" and the "how," we have analyzed how current political initiatives in Belgium compare. Looking at each component in the 11 elements, we determine how well Belgium stands globally in terms of facilitating digitization. The blueprint summarizes our views on what should be the aspiration of a worldclass digitized nation, and our analysis shows that Belgium is doing well in certain areas, but can do more in a couple of areas, especially in terms of enabling a successful implementation of a digital agenda (see Exhibits 7 and 8).

What clearly sets Belgium apart from many other nations is the coordinated initiative for a national digital agenda. Not only does it include initiatives in both the public and private sectors, but it is supported by a cross-departmental governing body and the advisory board Digital Minds, and is led by a senior minister for digital, backed by the prime minister. This puts the agenda as an absolute political top priority and enables alignment on initiatives. For maximum impact, and to ensure the agenda is on track, we think it is of high importance that the initiatives put forward are further detailed and trackable.

Belgium recently put in place a set of initiatives aimed at encouraging entrepreneurship and educating SMEs in the use of digital. The new Startup Manifesto includes several good measures to incentivize entrepreneurship, including both tax incentives and lowered cost of labor, as well as looking into increasing competitiveness for e-commerce by allowing night-time labor. The great challenge for Bel-

EXHIBIT 7 | The What: Prioritizing the right things – Belgium assessment against blueprint



Note: SME = small & midsize enterprise. MNC = multinational corporation. IP = Intellectual property. **Source:** BCG analysis

EXHIBIT 8 | The How: Enabling successful implementation of priorities – Belgium assessment against blueprint



gium is to make sure this support is taken advantage of. The digital tour, (the "Tournée Digitale"), the launch of digitalchampions.be, the initiatives of Digital Wallonia, the Flemish action plan on e-commerce, and the open data plan are good first steps, but we believe that continued timely efforts are needed to transform the mentality around entrepreneurship and scaling up early by using digital. A great challenge lies ahead which must be addressed if Belgium is to catch up with global leading nations. Introducing eIDs was a good start, but it needs to be taken to the next level as Estonia has with its e-residency and block-chain technology integration.

Enabling digital and technology is another area where Belgium does not score as high as leading nations. Digitization of government services is underway, but implementation and usage needs to happen faster to reach levels of world-leading nations. Also when it comes to investments in IT, telecommunications, and digital infrastructure, Belgium has a chance to focus its efforts and leap-frog into a leading position. Belgium's ambitious efforts for 2020 for high-speed Internet and mobile broadband technologies such as 4G and LTE Advanced are important to follow through on, but faster implementation is needed and thorough early efforts must be focused on the next generation. Belgium would therefore benefit from increasing its investment in IoT and establishing and adopting global standards when it comes to 5G technology. It is important to catch the next-generation wave.

Access to capital should also be improved. Due to Belgium's small size, more capital will most likely have to come from outside Belgium in order to facilitate more fast-growing startups that will become unicorns.

Regulation is an area where Belgium has improved significantly over the last few years, including fiscal and social legislation for the sharing economy as a part of "Digital Belgium," the passing of a national Digital Act, and efforts to encourage startups with the Startup Manifesto. Despite this, there are still areas for improvement when it comes to labor market flexibility and IP and data protection legislation, where Belgium would benefit from modernization, such as smart regulation and, where needed, even deregulation. The UK's recent modernization of IP legislation could serve as an inspirational example. Denmark's "flexicurity" model for the labor market could be another. We understand that there are great challenges when it comes to this topic, given Belgium's social laws, but it is worth putting extra effort into putting extra effort into, and thinking creatively about potential adjustments.

Moreover, we need to increase the skills of the workforce to avoid a future labor-force shortage of ICT skills. Taiwan's efforts in growing the semiconductor industry would be one example of linking education to research in specific industries and encouraging the workforce to adopt skills, as well as attracting talented individuals to these industries. The Technology Pact in the Netherlands, is a shared plan where national and regional governments, the business community, trade unions, and the education community will try to end the shortage of ICT skills but further efforts are needed to match the future demand in a digital world.

PRIORITIZED DOMESTIC INITIATIVES TO SPEED UP DIGITIZATION

B ASED ON BELGIUM'S STARTING point from the assessment of the country's initiatives for digitization, we suggest three areas to prioritize.

- Focus on encouraging and promoting digital entrepreneurship and the digitization of both SMEs and larger businesses.
- Update primary and secondary educational curricula, including increasing the focus on STEM, and introduce national workforce planning.
- Attract international capital for tech startups.

Focus on encouraging and promoting digital entrepreneurship and the digitization of both SMEs and larger businesses. The view on risk when it comes to starting a new business and scaling up using digital, as well as adopting innovative digital solutions for existing SMEs, must be revised. This is also applicable to larger companies. It's not easy to change a culture, but Belgium's comparatively conservative mindset when it comes to entrepreneurship and going digital must be addressed. Measures to drive change in the culture could include promoting digital champions and innovation via national competitions, educating SMEs on how to use open public data, increasing labor market flexibility, and steering public tenders toward SMEs. Government digitization could also be used to create a pull effect, for example via tax returns. The importance of digitization of SMEs for competitive growth in exports should also be further highlighted and promoted in the SME community

Updating primary and secondary educational curricula and introducing national workforce planning. Belgium is falling behind in terms of STEM and digital skills in the labor force. Discussions are not leading to concrete decisions and the implementation is not fast enough. The Belgian Alliance for Digital Skills and Jobs is a good initiative – also involving the private sector in the process – but concrete measures must be taken to ensure that decisions are made and actually implemented. Decisions and initiatives at the federal level must be translated into buy-in, and urgent action is required on the regional level, where educational initiatives are ultimately decided upon. To facilitate this process, and at the same time work to minimize the national gap in digital skills, national workforce planning can be introduced, where regions are invited to participate in the process, and also sign up to be responsible for delivering the skill supply to meet targets. Curricula should also be revised regularly and proactively to fit the digital era.

Attracting international capital. Given Belgium's small size and limited current investment capital, it is important to prioritize measures to attract international capital. This could either come in the form of attracting international top investment funds or creating new funds whose investment capacity is larger than current public alternatives – such as by collaborating with other nations in the region to set up a common fund. In both cases, Belgium would need to clearly communicate the benefits of investing in the nation's businesses.

THE NATIONAL DIGITAL AGENDA IN A EUROPEAN CONTEXT

A S IMPORTANT AS BELGIUM'S national digital agenda may be, it cannot accomplish everything alone. Belgium must also work with other countries with similar goals. This is even more important given the Brexit situation in Europe, where a large country with a relatively strong digital voice most likely will have less of a say going forward, increasing the importance of cooperation among smaller digital frontrunners.

The digital frontrunners would gain more than most from a DSM. They are also more vulnerable should a DSM not realize its full potential.

By assessing how European countries perform on a number of digitization and market openness parameters, a group of high-performing nations similar to Belgium emerges (see Exhibit 9). We refer to these countries as European Digital frontrunners. The group as we define it consists of **Denmark, Belgium, the Netherlands, Sweden, Estonia, Ireland, Finland, Norway,** and **Luxembourg**. These countries are characterized by being small in terms of population size, dependent on ICT exports, and highly digitized and innovative. The digital frontrunner group constitutes a likely set of partners for a successful digital push in the EU, however, Belgium should not close its doors to other countries which want to collaborate and don't happen to fit the criteria of a digital frontrunner.

The fact that the digital frontrunner countries are small means they have a more limited domestic market than bigger European countries such as the Europe Big 5 (Germany, France, the UK, Spain, and Italy). This in turn means that the digital frontrunners, as is the case for Belgium, can benefit considerably from easier access to the vast European market. The average ICT goods and services exports as a share of GDP for the digital frontrunners is 8%, compared with 2% for the Europe Big 5, indicating that their economies are indeed more dependent on exports than their bigger neighbors'. Belgium's ICT exports as a share of GDP may not be the highest in the group, at 4%, but it is still higher than the Europe Big 5 average. On the other hand, the digital frontrunners are more vulnerable

International collaboration. Digitization will benefit all European countries, but initially not to an equal degree. This leads to diverging priorities among countries. Belgium, being a small country, needs to find partners with whom it can drive an ambitious digitization and digital single market agenda on the EU level.



EXHIBIT 9 | The Digital Frontrunners and Europe Big 5

Note: Numbers have been rounded. For e-Intensity, Innovation, English proficiency scores: the higher the score, the better. Irish ICT exports have been adjusted downward to account for ICT service exports being inflated through tax schemes. Source: BCG analysis, OECD, EF, Akamai, EVCA, Global Innovation Index (Cornell University, INSEAD and WIPO)

should the digital single market not be realized to its full potential, with a greater risk of slower growth and job losses as a likely consequence of a less digitized EU.

Being above average in terms of innovation and digitization, Belgium is in a good position to benefit from the EU DSM and other efforts to remove regulatory and administrative barriers. Such initiatives would introduce a larger accessible market with healthy competition, where countries with competitive companies would thrive. And given that a high degree of digitization and innovation increases a country's readiness and ability to access and offer competitive products and services in an open digital market, Belgium would have an advantage.

Although all the digital frontrunners – Belgium included – are in a good position as individual countries when it comes to digitization and potential gains from the EU DSM, they still have limited influence on policy changes on an EU level, given their relatively small size. By working together toward common goals, they gain considerable influence. Given the digital frontrunners' similarities, it would be easier to agree on a joint course of action, promoting a digital single market, and other efforts that would open up the common market, benefiting Belgium, the other digital frontrunners, and in the long term, the whole of Europe.

Turning the digital tide in Europe. To further boost the nation's development toward digital, Belgium should engage in an international collaborative forum with the European digital frontrunners. This collaboration would speed the advent of the digitized economy in the European Union, and Belgium, as a small export-driven and digitally competitive nation, would benefit.

The initiative should include ministers responsible for digital in each frontrunner nation. The ministers would work closely together and also ensure close collaboration among permanent representatives in Brussels. This forum should be used to shape the European policy debate by closely cooperating with European institutions.

An alliance such as this is also an opportunity to understand common concerns and how the nations could work together when it comes to national policy solutions to ease the implementation of the DSM and encourage digitization.

Belgium should collaborate and share best practices with other digital frontrunners to drive the digital agenda in the EU.

The frontrunner nations have an opportunity to become a global trendsetter and idea generator, when it comes to digitization, similar in influence to the International Energy Agency. This might include inviting international scholars, business leaders, and politicians from other countries which are leveraging digitization to drive economic and societal development, in order to encourage a nuanced discussion on digitization.

This is also a chance to conduct – and learn from – digitization benchmarking. Yearly

benchmarks could be set up to compare European nations and learn from global worldclass initiatives. The international perspective would serve as an inspiration for Belgium's digital agenda, thus helping the country keep up its global competitiveness.

Concluding words

We hope this report will contribute to the public debate on digitization of Belgium – and Belgium's role in Europe's digital development – with senior politicians and business leaders. Belgium, as well as the entire Union, stands to gain enormously from digitization and a single market in Europe that is adapted to the digital era.

In light of the quickly digitizing nations outside of Europe, the current pace of development we see in Belgium will not be enough to claim a global top position when it comes to digitization. Belgium needs to look into adopting a comprehensive national digital agenda with well-targeted initiatives. To facilitate growth of domestic businesses, especially SMEs, and promote competitive strength, Belgium must also engage in an urgent push for a true single digital market in Europe, via its digital minister, together with the European frontrunners.

APPENDIX: METHODOLOGY

The methods and assumptions used throughout the report are outlined in this chapter.

e-GDP

e-GDP is a measure that quantifies the monetary value of the Internet on a country level. Comparing it with the GDP of a country yields the economic share of Internet-related activities in the country.

There are several ways in which the GDP can be calculated. The figures in this report have been calculated using the *expenditure method*. This method measures total spending on finished goods and services in an economy. The underlying principle is that all finished goods and services are bought by someone and that, consequently, the value of production (of which GDP is a measure) equals total expenditure.

Our choice of the expenditure method is based on two things. First, expenditure data is more readily available and makes comparisons across different countries easier and more reliable. Secondly, the expenditure method makes it possible to distinguish among spending of households, companies, and the government in order to bring additional insight.

The expenditure method is computed as the sum of four components:

- 1. *Consumption:* This covers the goods and services bought online by households in a country. It also includes consumer spending on Internet access and the relevant cost of devices used to access the Internet.
- 2. *Investment:* Capital expenditures of telecom companies and Internet-related private investment in information and communications technology (ICT).
- 3. *Government spending:* Public spending on ICT infrastructure and software along with supporting services.
- 4. *Net exports:* The difference between exports and imports of ICT equipment and services.

Trusted sources for spending have been used to allow for cross-country comparability. Such sources include Gartner, Ovum, IDC, Euromonitor, WTO, UN, OECD, and the World Bank. In addition to this, country-specific sources, mainly statistics services, have been used for greater granularity in consumption and import and export data. When computing aggregated figures for groups of countries, the included countries have been considered as a single economy.

As most global sources are presented in US dollars, this currency has been used as cur-

rency of reference throughout. In order to reduce the possibility of exchange rate fluctuations over time influencing some countries more than others, an average exchange rate for 2010-2015 has been used for currency conversions over the entire studied period (2010-2020).

BCG e-Intensity index

The BCG e-Intensity index is a measure of how strongly a country has embraced the Internet. It is updated on a yearly basis to track performance over time. The e-Intensity score is computed based on a weighted average of three sub-indices:

- 1. *Enablement:* Measures the presence of Internet infrastructure and how available Internet access is
- 2. *Expenditure:* Measures the share of consumer spending which is online and how big the online share of advertising is

3. *Engagement:* Measures the extent to which consumers, businesses, and governments embrace the Internet

The weights of individual metrics can be seen in Exhibit 10 below.

When it comes to future projections of e-GDP scores, extrapolation of historic data has been used. The results have been adjusted for outliers.

Impact of digitization and DSM on GDP and jobs. When projecting the impact on GDP from policy shifts, new markets, and other types of changes, one needs to handle a large number of unknown factors. The best and most reliable way of doing this is with a computer model that makes use of as many relevant input variables as possible. The E3ME model from Cambridge Econometrics is a good example of such a model. It is often used to simulate outcomes of changes to societies and economies.



EXHIBIT 10 | BCG E-Intensity Index Composition

Source: BCG analysis, Magna Global, UN, WEF, ComScore, ITU, Euromonitor, Ovum

In our analysis for this report we have used the output from the E3ME model simulation of the DSM. This output has then been allocated to the EU member states based on a set of assumptions.

- Economies that are more dependent on exports will see larger shifts in GDP from regulatory changes that affect trade.
- Nations with economies that are more digital will see larger effect from changes that affect digital trade and standards.
- A country will see an effect on its GDP that is in proportion to the comparable size of that country's GDP size.

These assumptions have been built into a model and then been equally weighted. This has in turn rendered our presented results.

When modeling the potential impact of increased level of digitization we have adopted a market-driven approach. A few emerging high-value markets were identified. Estimates for these markets were then established by multiple sources. The impact on the different countries were then calculated based on an assumption that a world-class level of digitization would enable a country to control a share of these markets that is proportional to its share of the Gross World Product.

The net impact on jobs is calculated by using a productivity metric called Gross Value Added Per Hour Worked. We have assumed that an increased level of digitization will increase labor productivity and thus require fewer employees to produce the same amount of value. When using this new level of productivity we can calculate an approximate number of new jobs that will be needed to create a specific level of GDP-impact. While future job creation is difficult to predict, this approach gives the reader a good approximation for the magnitude of the benefits of digitization.

Overall we have used trusted sources for general data on GDP, exports, and workforce statistics. These sources include; the World Bank, OECD, Eurostat, CIA World Fact Book, IDC, Gartner, and more.

NOTE TO THE READER

Authors

Emanuelle Alm is a consultant in Stockholm at The Boston Consulting Group. **Niclas Colliander** is a consultant in the firm's Stockholm office. **Filiep Deforche** is a senior partner and managing director in BCG's Brussels office. **Fredrik Lind** is a senior partner and managing director in BCG's Stockholm office. **Ville Stohne** a consultant in the firm's Stockholm office. **Olof Sundström** is a principal in BCG's Stockholm office.

For Further Contact

This report was prepared by BCG's Nordic Technology, Media & Telecommunications practice. If you would like to discuss the content of this report, please contact one of the authors.

Fredrik Lind

Senior Partner and Managing Director BCG Stockholm +46 733 470 380 lind.fredrik@bcg.com

Olof Sundström

Principal BCG Stockholm +46 706 476 472 sundstrom.olof@bcg.com

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