



# SERVICES TRADE AND MANUFACTURING





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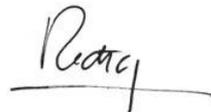
# FOREWORD

Globalisation and technological progress have blurred the distinction between goods and services companies: services are not only key enablers of the global production networks that many manufacturing companies rely on but they are also increasingly embodied in or supplied alongside manufactured products. As a result, trade in goods and trade in services can no longer be treated separately. Only in this way can we tackle the barriers to the cross-border supply of the integrated solutions that are key for the competitiveness of the European industry.

But how do services intervene concretely in the operations of manufacturing companies and why does the liberalisation of services trade matter to them? This publication seeks to answer this question through examples from the ground. Based on input received from both small and large companies, nine case studies illustrate the role that services and services trade play across different manufacturing sectors. Although the cases are anonymised, all of them are real-life examples of individual companies.

We hope that the cases presented in this brochure will help raise awareness of the close interconnection between trade in goods and trade in services and make a useful contribution to developing a trade policy that is fit for the realities of 21st-century trade.

**Pierre Gattaz**  
President



**Markus J. Beyrer**  
Director General



# TABLE OF CONTENT

FOREWORD ..... 3

SERVICES IN MANUFACTURING..... 6

    Relevant data ..... 6

    The role of services in manufacturing ..... 8

    Services as trade enablers ..... 10

    The relevance of services chapters in FTAs for manufacturers..... 10

## EXAMPLES

    Industrial goods ..... 13

    Process technologies and automation solutions ..... 15

    Medical products..... 18

    Powerplants and marine engines ..... 21

    Dental equipment..... 24

    Cranes and lifting equipment..... 26

    Automotive industry ..... 29

    Wind turbines..... 31

    Chemicals ..... 33



# EXECUTIVE SUMMARY

Services account for 34.2% of the value added in EU manufacturing exports and play a key role for companies across manufacturing sectors. These companies do not only rely on services to manage their international production networks but increasingly provide integrated solutions, consisting of goods and services, to their customers. The servicification of manufacturing also has implications for trade policy as goods trade and services trade can no longer be treated separately. On the one hand, manufacturers benefit indirectly from liberal provisions in the services chapters of free-trade agreements (FTAs) as these enable them to work with world-class service suppliers globally. On the other hand, services trade liberalisation brings down obstacles to the delivery of manufacturers' own increasingly integrated solutions. Consequently, FTA provisions on all four modes of services supply matter for manufacturers

**Provisions relating to cross-border trade in services (Mode 1)**, particularly cross-border data flows, are critical for the digital transformation of the economy. For example, they allow companies to optimise product performance, reduce downtime by detecting problems early or help customers to fix problems remotely. However, data localisation requirements limit the provision of these services in some countries. Moreover, the uncertainty created by the lack of clear international rules deters companies from fully exploiting the opportunities offered by the fourth industrial revolution.

**Provisions relating to consumption abroad (Mode 2)** make it easier for EU-based companies to repair products and train staff in their headquarters. While repair is a service, it also involves customs procedures resulting from the repeated cross-border movement of the defective/repaired products. Regarding training, the procedures to get a visa allowing non-EU staff to come to the EU can be cumbersome and lengthy.

**Provisions relating to the commercial presence abroad (Mode 3)** make establishment in third countries easier for manufacturers and service providers. Many manufacturers have a commercial presence in third countries where they do not manufacture as the services staff present there enables them to better respond to market-specific customer needs. They face many of the same barriers to their activity as service providers, and regulatory differences across markets (e.g. on the use of refurbished spare parts) make it difficult to deliver the same service everywhere. It is thus important that FTAs liberalise establishment for services highly relevant to manufacturers (e.g. rental/leasing, engineering, maintenance and repair, marketing etc.).

Finally, **provisions on the temporary movement of natural persons (Mode 4)** are highly relevant to manufacturing companies: the delivery of services, such as marketing and sales, customer training and technical consulting, plant optimisation, unit installation, commissioning, supervisory or maintenance and repair, often requires the temporary presence in third countries of EU-based staff with an educational background in e.g. engineering, technology, chemistry, IT or economics. FTAs can foster the mutual recognition of the relevant professional qualifications and make it easier for companies to get short-term visas and work permits.

This brochure illustrates the importance of services trade for manufacturers with nine non-fictional examples of concrete companies active in different manufacturing sectors.





# SERVICES IN MANUFACTURING

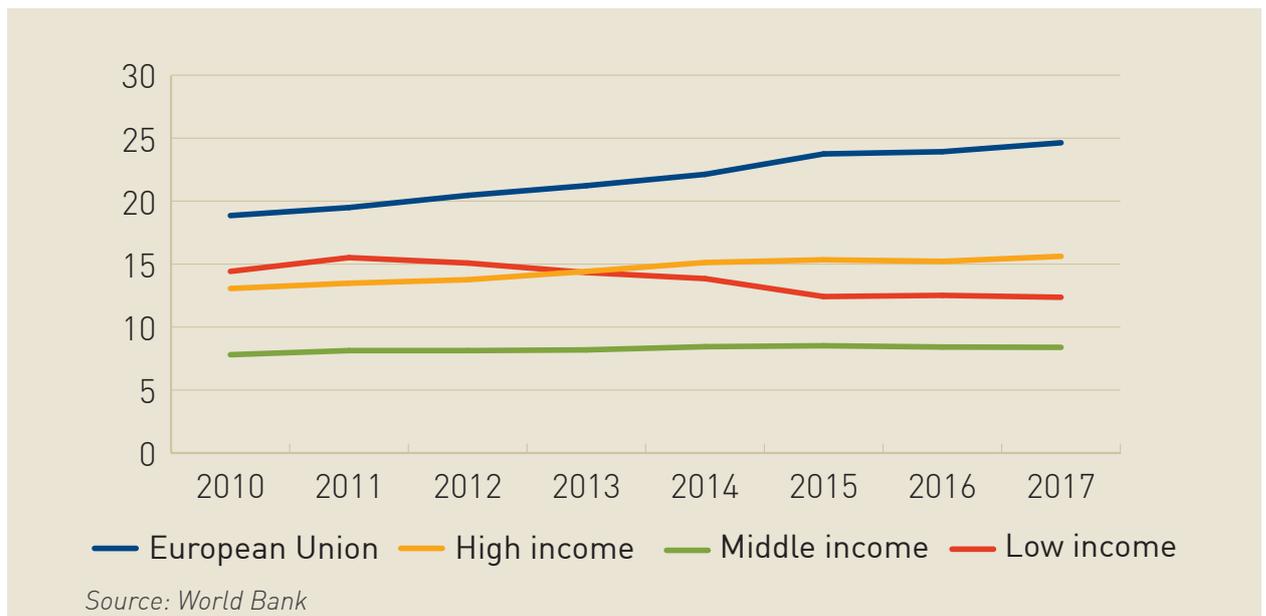
## RELEVANT DATA

While services have always been indispensable for manufacturers producing and trading their products across borders, the rise of international production networks has made them key to the operations of an ever-growing number of businesses. With the fourth industrial revolution in full swing, awareness of the close connection between goods trade and services trade in modern international value chains has increased. It has become abundantly clear that trade barriers to goods trade negatively impact the services embedded in them or supplied along with them and vice versa<sup>1</sup>.

For the EU, this is highly relevant: overall, services account for over 70% of EU GDP, and the value of EU trade in services amounts to 24.9% of EU GDP – a value that has doubled since the late 1990s<sup>2</sup>. As Chart 1 shows, the importance of services trade is significantly higher for EU Member States than for high-income countries in general, for which the average was merely 15.6% in 2017.

**Chart 1**

### Trade in services - Percentage of GDP

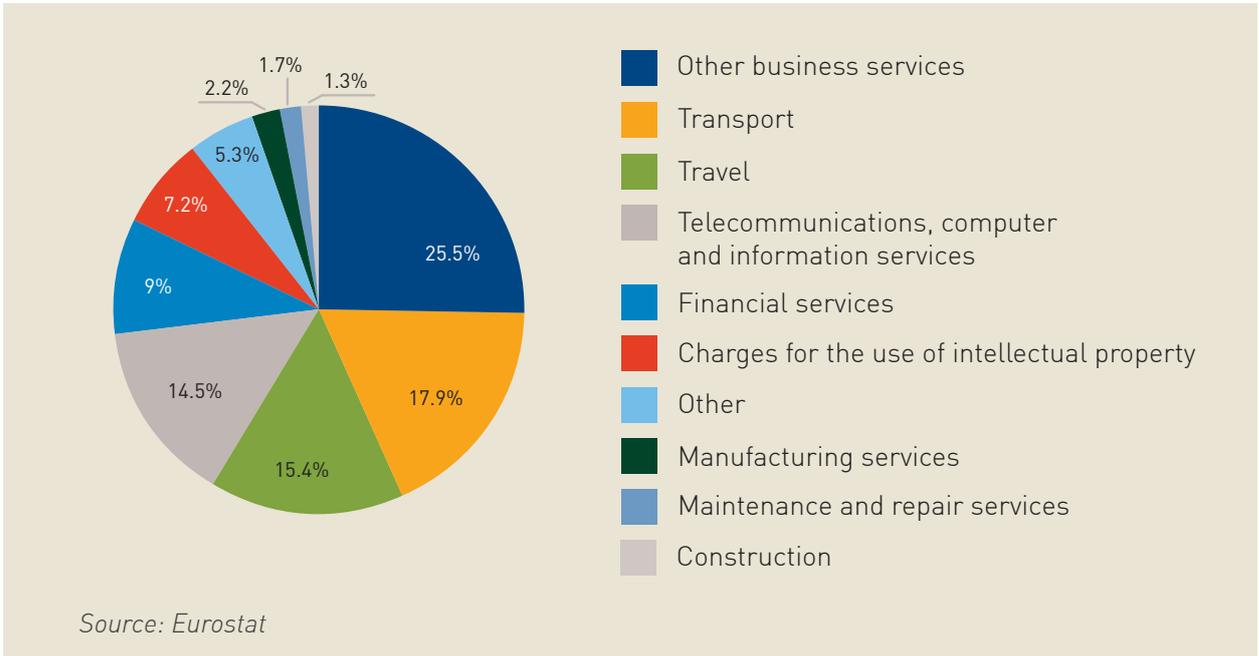


Other business services, which comprise mainly research and development (R&D), professional and management consulting services as well as technical and trade-related services, are the EU's largest services export category, accounting for 25.5% in 2018. Transport services, travel services and telecommunication, computer and information services follow, making up 17.9%, 15.4% and 14.5%, respectively. Due to the overall size of EU services exports, even the value of smaller categories, such as maintenance and repair services, is non-negligible: while they account for merely 1.7% of total EU services exports, exports under this category were worth €20.4 billion in 2018 (see Chart 2).

1 <https://www.fdfa.be/sites/default/files/atoms/files/Brexit%20impact%20study%202019.pdf>

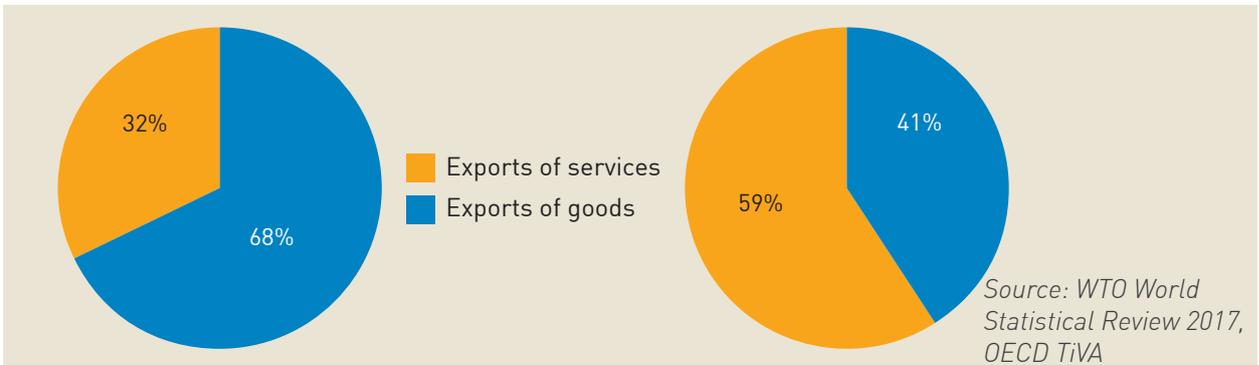
2 [ILOSTAT](#) and [World Bank](#)

**Chart 2**  
**Composition of EU services exports in 2018**



In total, 32.2% of extra-EU exports were services in 2016<sup>3</sup>, in terms of balance of payments (BoP)<sup>4</sup>. Yet, BoP statistics tend to largely underestimate the real weight of services trade as they do not consider services that are included in the value of exported goods: in OECD countries, an average of one third of the total value added in manufactured goods exports is generated by services. In the EU, services account for 34.2% of the value added in EU manufacturing exports. As a result, if we measure EU trade in value-added terms (TiVA), 58.5% of total EU exports were services exports in 2016. Of these, domestic services made up 90% and foreign services 10% of the value added. Chart 3 juxtaposes the two ways of measuring trade in services. With these numbers in mind, it is not surprising that, in value-added terms, the EU's services exports make up 61% of the 36 million jobs supported by EU exports<sup>5</sup>.

**Chart 3**  
**EU exports in BoP, 2016**                      **EU exports in TiVA, 2016**



3 2016 was chosen to ensure comparability as this is the latest year for which OECD TiVA data is available.

4 WTO, *World Trade Statistical Review 2017*

5 European Commission, *“EU exports to the world: effects on employment”*, 2018



## THE ROLE OF SERVICES IN MANUFACTURING

Services play an increasingly important role in manufacturing exports. While they often contribute directly to the value chain (e.g. financial services, telecommunication, logistics, IT) a substantial and increasing share of services is either embodied in manufacturing products, forming part of the value of the good (e.g. intellectual property, software, design), or supplied in connection with the product as embedded services (e.g. after-sale or customer care services). This phenomenon is linked to the growing servicification of manufacturing: manufacturing firms purchase, produce and sell more and more services at all stages along the value chain and, as a result of technological advances, they increasingly offer integrated solutions, combining goods and services. The reasons for this are manifold: inter alia, services can help manufacturers to differentiate their products from those of competitors or to generate increased revenue through additional sales to customers. Manufacturing firms use services when they:

- ◆ develop new products (e.g. engineering services, R&D, design services, consulting);
- ◆ produce products (e.g. management consulting, technical testing, software);
- ◆ distribute products (e.g. transportation, logistics, warehousing, wholesale/retail services);
- ◆ sell products (e.g. retail services, branding, advertising, leasing services); and
- ◆ provide aftermarket services (e.g. maintenance services, installation of industrial equipment, after-sales services).

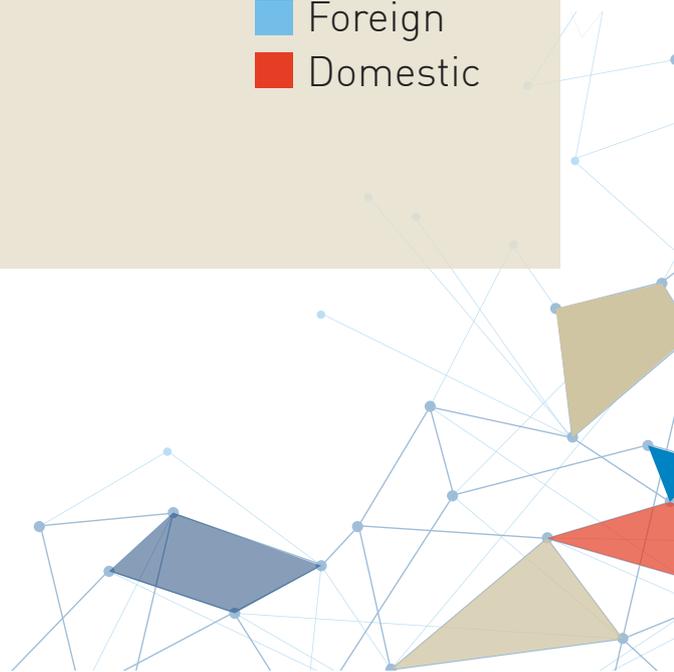
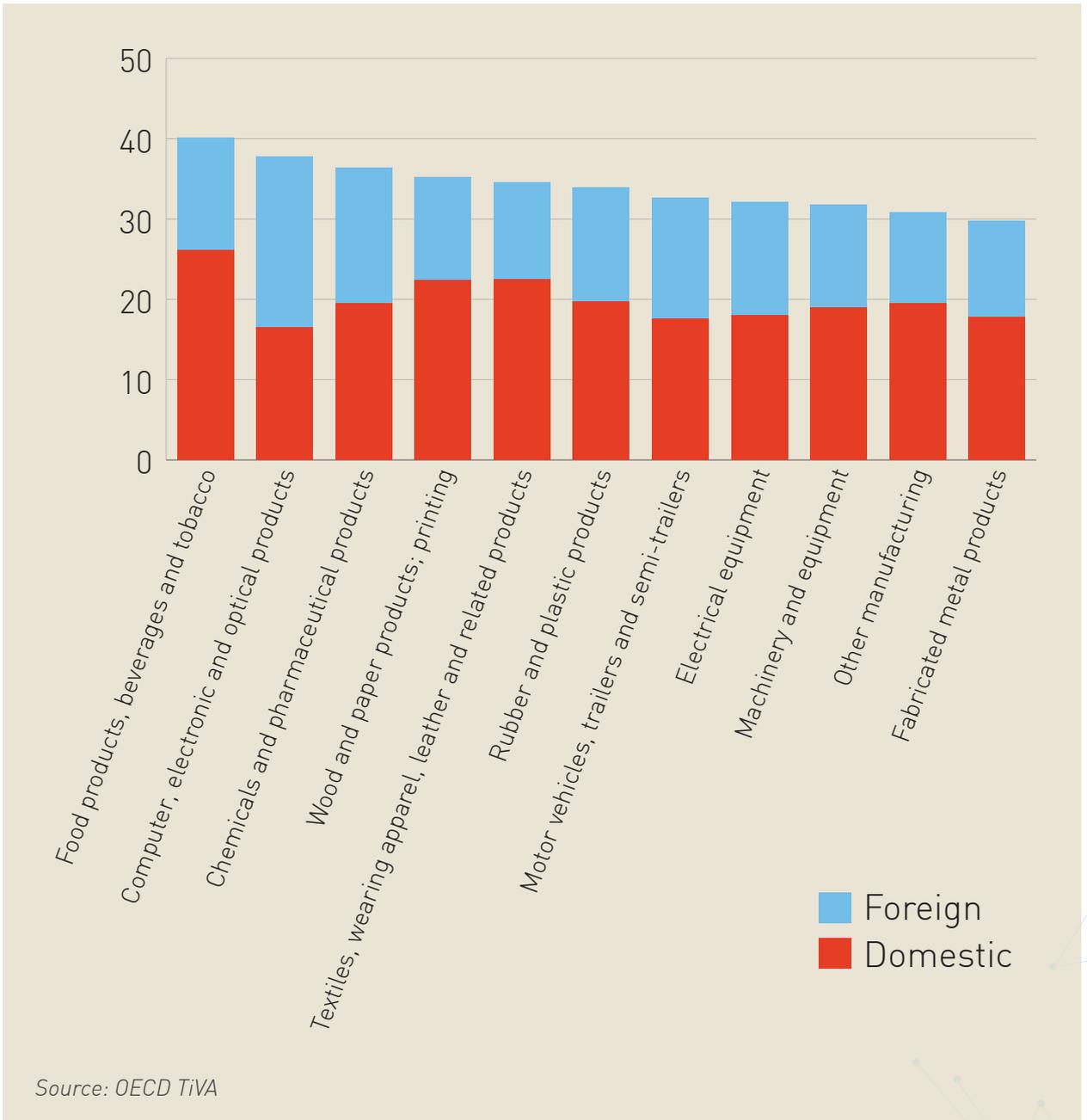
As services account for an increasing share of the value added in manufactured products, the distinction between industry and services companies is becoming blurry. Even more so as, in many manufacturing sectors, the activities along the value chain that generate most value are services activities. Chart 4 illustrates the percentage of value added by services, either domestic or imported, in the value of EU manufacturing exports in different sectors. With 40.2% of value added, food products and beverages are the category for which services play the greatest role. Computer, electronic and optical products come second. There, services account for 37.8% of the value added and it is interesting to note that imported services represent more than half of this share. With shares of between 36.4% and 34.6% of the value added, chemicals, wood and paper products and textiles and apparel are also located in the upper half. The 32.7% that services make up in the value added in motor vehicles are almost equally composed of domestic and foreign services.

While the servicification of manufacturing is a general trend, it is more pronounced in some EU countries than in others. In Denmark, for example, the percentage of manufacturing companies that add services to their physical products tripled between 2007 and 2017 – from approximately 20% to 60%<sup>6</sup>. With digitalisation, fragmentation of the production and disruptive technologies, such as the Internet of Things or 3-D printing, this trend is likely to accelerate in the coming years.

6 DI Analyse, *Upward tendency for adding services to physical products*, 2019

**Chart 4**

**Services value added in EU manufacturing exports across industries**



## SERVICES AS TRADE ENABLERS

Services are also key enablers of the global production networks many manufacturers rely on. Services promote trade integration by providing basic infrastructure on which goods trade relies and act as the glue that connects the fragmented and dispersed production stages typical of today's global value chains. In this way, they assist companies in entering foreign markets by reducing transaction costs or adapting and marketing products. Some examples:

- ◆ Financial, legal and professional services help exporters reach new markets;
- ◆ Transportation, logistics and distribution services move intermediate products to assembly lines and final ones to consumers;
- ◆ Digital networks established by telecommunications and computer services transmit knowledge, design and content.

For manufacturing companies present in several countries it is more efficient to work with the same services providers in all the countries where they are present (e.g. banking, insurance, telecommunication, etc.). Therefore, manufacturing companies also benefit indirectly from liberal provisions in the services chapters of free-trade agreements (FTAs) as these enable services companies to deliver the same service for them globally.

## THE RELEVANCE OF SERVICES CHAPTERS IN FTAs FOR MANUFACTURERS

All this makes the services-related chapters of FTAs, which account for around half of the pages of recent FTAs (e.g. CETA), highly relevant to manufacturing companies as they increase legal certainty for all sectors of the economy:

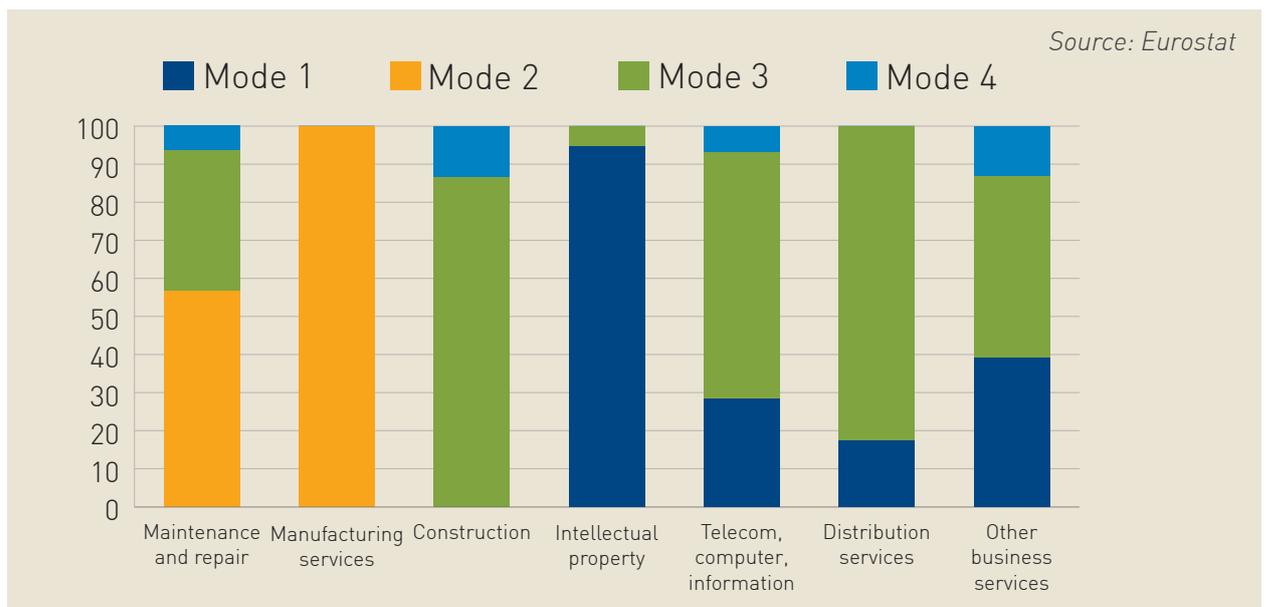
- ◆ **Provisions relating to cross-border trade in services (Mode 1)** are critical for the digital transformation of the economy (e.g. machine-to-machine communications, 3-D printing, Internet of Things, etc.). In this context, ambitious provisions on cross-border data flows will be necessary for trade rules to be fit for the so-called fourth industrial revolution.
- ◆ **Provisions relating to consumption abroad (Mode 2)** make it easier for EU-based companies to repair products that were sold to customers in non-EU countries or to have staff employed in non-EU countries attend trainings and seminars in their EU headquarters.
- ◆ **Provisions relating to the commercial presence abroad (Mode 3)** do not only cover services but all sectors, including manufacturing (e.g. manufacture of textiles, manufacture of chemicals and chemical products, manufacture of rubber and plastics products, manufacture of machinery, etc.). They also cover services highly relevant to manufacturers (e.g. rental/leasing services, engineering services, maintenance and repair services, marketing etc.). If the industries that would benefit from the possibility to establish freely in a partner country do not pay

attention to the technical aspects of this part of services negotiations, opportunities may be forgone with these sectors remaining comparatively closed.

- ◆ Finally, **provisions on the temporary entry and stay of natural persons (Mode 4)** also cover professions relevant to manufacturing companies (e.g. managers or technicians and engineers who travel for installation, maintenance, repair or after-sales services).

Chart 5 illustrates this point by showing the importance of different modes of supply in the EU's exports of services that are important for manufacturing companies. As closeness to the customer is important for services, commercial presence abroad (mode 3) is unsurprisingly the most dominant mode of supply for most of the services listed. Interestingly, with around 57%, the major part of maintenance and repair services are supplied across borders (Mode 1). This reflects the trend among companies to increasingly solve problems remotely making use of modern information and communication technologies, e.g. by exploiting data supplied by sensors installed on their products. Company staff physically travelling to a customer's site makes up for 6% of EU exports under this category, while cases where the faulty product is sent back to the EU for maintenance and repair (mode 2) account for 37%. For construction services (including installation of machinery, production lines, etc.) the large majority of services are delivered through local presence. Yet, with Mode 4 making up for over 13%, also the possibility to send staff abroad plays an important role. Other business services<sup>7</sup> are delivered mainly via commercial presence abroad (48%) but also cross-border supply (39%) and temporary presence of natural persons (13%) play significant roles. Finally, as telecommunication, computer and information services and distribution services are delivered mainly via Modes 3 and 1, the possibility for service suppliers in this sector to establish commercial presence abroad is important for manufacturers to have access to world-class ICT and distribution services.

**Chart 5**  
EU services exports by modes of supply



<sup>7</sup> These comprise mainly R&D, professional and management consulting services as well as technical and trade-related services.



Chart 5 clearly shows that for many services, different modes of supply are complementary. At the same time, in many areas tariff liberalisation and services liberalisation need to go hand in hand to achieve outcomes that really facilitate the operations for manufacturers. Modern maintenance and repair services, for example, require the free flow of data and the temporary cross-border movement of staff but also the facilitation of trade and use of different kinds of spare parts in third countries. If trade in goods and trade in services are treated separately in trade negotiations and the focus remains on tariff liberalisation, some services vital for the operations of manufacturing companies may be neglected. These include maintenance and repair services, services incidental to manufacturing, which are central for e.g. the installation and fitting and maintenance of machinery. Other examples are R&D services, technical testing and analysis services or rental and leasing services. Moreover, lack of mutual recognition of professional qualifications relevant to manufacturers and restrictive provisions on the temporary entry and stay of natural persons present obstacles to business operations in third countries.



This brochure aims at shedding more light on the increasingly important role that services and particularly the liberalisation of trade in services play for manufacturing companies by providing some concrete examples. Based on a questionnaire sent to companies in different manufacturing sectors, it presents a number of illustrative cases showing more clearly why services liberalisation matters for manufacturing companies and which barriers need to be addressed better in the future.



## EXAMPLE: INDUSTRIAL GOODS

This company produces glass fibre tissue and glass fibre and carbon fibre-based fabrics. Its glass fibre tissues are typically used as carrier layer in vinyl flooring, as wall liner material or as surface layer in composite panels for truck trailers and recreational vehicles. The fabrics it produces are used mainly as reinforcements in windmill blades or boat hulls, or as anticorrosive in e.g. pipes.

### THE ROLE OF SERVICES IN THE COMPANY'S OPERATIONS

Services are key for almost all the company's activities. Besides more obvious functions, such as transportation of its products and maintenance of its assets, the company draws on engineering services when it invests in new assets or production processes and hires external management consultants to coach and develop its staff. Furthermore, its R&D services are crucial for maintaining its leading position on the market: while about 70% of its R&D activities focus on developing new products, 30% aim to enhance existing products to better meet the needs of customers.

The company also provides its customers with value-adding services that complement its product offer: these help customers reduce their end-product's time to market, co-develop and test new products, and fill gaps in their production capabilities. For example, the company's technical customer service staff works together with clients to develop solutions that help them minimize their raw material usage, improve efficiency of their processes or solve possible issues related to raw materials in their processes.

While the company mainly works with external service providers for engineering, training, transportation or consulting activities, about 20% of its employees have services-related jobs within the company. The services provided in-house include management and back-office support, R&D, warehousing, sales and after-sales services, such as its technical customer service.



## SERVICES TRADE AND EU FTAs

The company's main markets outside the EU are North America and China. On both markets, additional costs challenge the company's competitiveness: in North America, freight costs and customs duties have a significant impact on its prices, forcing the company to focus on selling high-priced specialised products to be able to compete. In addition to these factors, the company faces fierce price competition, intellectual property theft in its operations in China. As the company cannot compete on price on these markets, its comprehensive services offer helps it differentiate its products and sell solutions for which customers are willing to pay a premium.

To increase sales and ensure the highest levels of customer satisfaction, the company's sales and technical customer services staff frequently travel to non-EU countries where the company is active. While the former help to market products and contract clients, the latter form part of the after-sales services the company offers. Amongst other things, they help customers encountering technical issues and support the customer with how to use the company's products optimally. Typically, the staff sent abroad has an educational background in chemistry, economics or technology-related disciplines. Provisions facilitating the temporary stay of these professionals in non-EU countries, including the recognition of their qualifications, are key for the company to deliver its comprehensive solutions, particularly because it does not have offices or production facilities in any country outside the EU.

As the company provides tailor-made solutions to its customers globally, it needs to be able to transmit and process the data necessary for its product specification rapidly across borders to adapt its products accordingly. The free flow of personal and non-personal data between the EU and other countries in which it is active is therefore highly important for the company.

For the services the company does not deliver in-house, it typically works with the same external services providers in its operations all around the world to reduce transaction costs and optimise results. For example, it has global contracts with insurance providers, IT vendors, banks and logistics companies. In this way, it indirectly benefits from liberal services provisions in EU FTAs as these make it easier for European services providers to offer the same solutions in different countries.





## EXAMPLE:



# PROCESS TECHNOLOGIES AND AUTOMATION SOLUTIONS

This company is a leading developer and supplier of process technologies, automation solutions and services for the pulp, paper and energy industries. Its technology offer includes pulp mills, tissue, board and paper production lines, as well as power plants for bioenergy production. In addition, the company's advanced services and automation solutions improve the reliability and performance of its customer processes and enhance the effective utilisation of raw materials and energy.

## THE ROLE OF SERVICES IN THE COMPANY'S OPERATIONS

Services play a key role in the company's operations, both in the development, production and delivery of its products and as a means to help customers make optimal use of its products and solutions. Its products are not "off-the-shelf" items. Rather, the company modifies and adapts its products and technologies to meet the specific requirements of each customer. A new paper-drying section, for example, needs to fit with the rest of the customer's paper production line. Even if the customer buys the entire production line from the company, it must be tailored to the customer's needs. It goes without saying that this adaptation of products and solutions is very services-intensive.

Besides helping its customers to identify suitable products and processes and adapting them to their needs, the company provides its customers with a wide range of aftermarket services, ranging from maintenance to performance monitoring and optimisation. The individually tailored services its experts provide on-site or remotely include monitoring and repairing equipment, performing studies and audits, planning, executing and managing development and maintenance actions or holding trainings and seminars for its clients' staff.

While the company has its own in-house personnel for most of the above-mentioned support functions as well as for its digital services, it largely relies on external suppliers for transportation, logistics, IT, security and cleaning services and, to some extent, it also outsources its maintenance services. For its process technology projects (e.g. adaption, delivery and installation of machinery/production lines), for example, it partly uses:

- ◆ outsourced engineering and design services to adapt its solutions to individual customers;
- ◆ outsourced logistics and transportation services for delivery; and
- ◆ it works with external installation service firms for the on-site installation of its products.



As a result, only between 25% and 35% of the cost of the company's process technology projects result from in-house operations while the remaining cost results from outsourced services.

Due to the vast variety of services the company offers to its customers, around 48% of its staff work in services-related jobs: more specifically, 44% of its employees work in providing aftermarket services to the customer while 4% are tasked with management and in-house support functions.

## SERVICES TRADE AND EU FTAs

Outside the EU, the company's main markets are the USA, Canada, Japan, China, Russia, Indonesia, Brazil and Chile, which together make up around half of its revenue. While the company's R&D and engineering functions are mainly located in Europe, it manufactures close to its customers, including by using subcontractors in non-EU countries. One of its three main manufacturing sites is located in China.

The company has subsidiaries in all its main markets, with sales and maintenance personnel present on the ground. While its subsidiaries are mostly treated equally to local companies by the respective governments, in some cases the company chose to enter into joint ventures with a local enterprise. Moreover, the company faces local content requirements in some regions.

Some of the operations related to the company's projects outside the EU, such as sales, installation and maintenance services, require the temporary presence of EU staff in non-EU countries. The professionals concerned are mostly project managers, technical experts and engineers. Getting the relevant work permits can be challenging at times, which is why liberal provisions on the temporary entry and stay of relevant professionals as well as the mutual recognition of their professional skills in EU FTAs are key.

### **Example: Industrial Internet services**

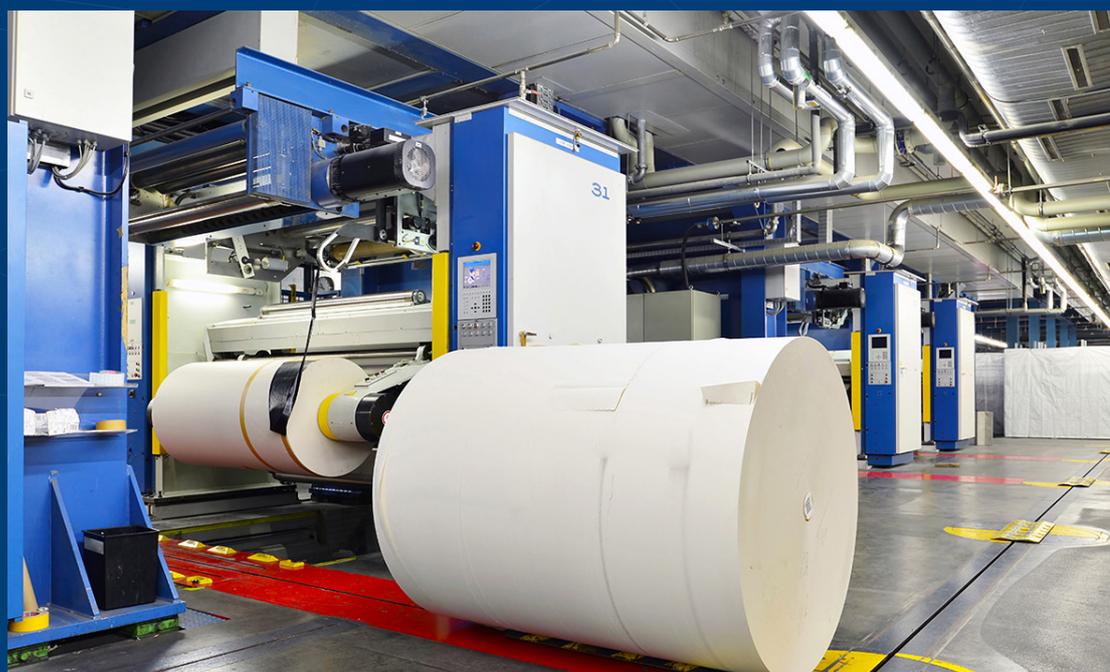
The company's machinery is equipped with sensors and measurement devices that gather data that allows its experts to monitor and optimise its performance. This allows the company to offer a wide array of services based on the Industrial Internet. Experts in specialised EU-based performance centres support customers through remote connections and tools, including:

- ◆ Continuous remote monitoring, controls, fine-tuning and optimisation;
- ◆ Real-time remote support;
- ◆ Big-data analysis services based on agreed targets, e.g. for defining root causes for process variations.

If remote support is not enough, the centers send local experts or, in the case of more complicated issues, experts from the headquarters to the customer's site to fix problems.

To coordinate activities between its subsidiaries in many countries around the world and provide tailored services to its clients no matter where they are, the cross-border flow of data, including customer data, is important to ensure smooth operations. To be able to monitor and optimise the performance of its customers' machinery as part of its Industrial Internet services, particularly the free flow of non-personal data plays an important role. Even more so as it relies on cloud services to store and evaluate data collected at the production sites of different customers to offer superior performance and analysis. Data localisation requirements, which the company encounters in some regions, are therefore a challenge to its work and limit the scope of the services it can offer to clients. Moreover, due to the lack of clear international rules, including on data ownership and the distinction between personal and non-personal data, clients often hesitate to allow access to their data.

To make its operations more reliable and efficient, the company works with the same global transportation and financial services providers in its operations around the world. Thereby, it benefits indirectly from the liberalisation of trade in services in these sectors. To some degree, the company also imports engineering and design services from emerging countries, such as India, for its projects. While this works rather smoothly when the services are delivered across borders (Mode 1), the company faces significant challenges, e.g. concerning work permits, when these same service providers need to send staff to the EU as part of their assignment.





## EXAMPLE: MEDICAL PRODUCTS

This company develops, produces and sells medical products, services and solutions connected to healthy living, prevention, diagnosis, treatment and home care. Its main products include:

- ◆ Large medical imaging equipment (e.g. X-ray machines) and related software (e.g. to support precision diagnosis of medical conditions);
- ◆ Image guidance systems and devices to support minimally invasive treatments in the area of, amongst others, cardiology (e.g. catheterisation laboratories);
- ◆ Connected care solutions including patient monitoring and analytics to improve clinical outcomes and reduce the length of hospitalisation;
- ◆ Healthy living solutions (e.g. electronic toothbrushes, healthy cooking solutions).

While most of its products and services are typically sold to healthcare providers, its personal health solutions are mostly for private consumers.

### THE ROLE OF SERVICES IN THE COMPANY'S OPERATIONS

Within the company, services are used extensively along the entire value chain. A few examples include:

- ◆ Management consulting services to identify market potential and possible customer appeal for new solutions;
- ◆ Logistics services to manage and operate its global supply chain of intermediate products, spare parts and finished goods;
- ◆ Distribution services to sell and deliver solutions on market with limited local presence;
- ◆ Financial services to support customers with major purchases;
- ◆ Maintenance services, including repair services;
- ◆ Tailor-made lifecycle services that help customers enhance and extend the useful life of a product and keep the product up to the newest standard throughout its lifetime (e.g. software updates for equipment);
- ◆ Performance services using technology and data insights to help customers better use their equipment and maximise asset utilisation.



These and other services are both delivered in-house and by external contractors, depending on what is more efficient and cost-effective. In general, services related to the company's core business, for which specialised knowledge is necessary, are more likely to be delivered in-house. However, the share of outsourced services in the company's operations also reflects country-specific circumstances and differs widely across the countries in which it is active. All together, in terms of full-time equivalents, an estimated 20% of the company's employees work in jobs directly tied to services, which means that, in practice, a higher share works in jobs that include services-related tasks.

## SERVICES TRADE AND EU FTAs

The company has a strong global presence, with more than 60% of its revenues derived from sales and activities outside the EU. Therefore, the company must ensure its products and services comply with different national health, medical and other regulations. This means that product design, supply chains as well as sales, marketing and aftermarket services need to be adapted accordingly. For example, regulatory differences have a major impact on the company's maintenance services: the company can supply these at a lower price if it can use refurbished and second-hand spare parts to repair clients' equipment. However, the use of such second-hand spare parts is not allowed in some countries. Moreover, importing spare parts, particularly second-hand spare parts, can be cumbersome and costly. In these cases, the company must adapt its maintenance services accordingly.



While the company has its headquarters in the EU, its production plants are also located in a number of non-EU countries, including the USA and China. Therefore, plant optimisation, rationalisation or other manufacturing projects frequently require EU-based staff to travel temporarily to non-EU locations. Moreover, the company's aftersales services as well as the trainings it provides to its customers, e.g. to help them tailor the services offered alongside its products to their needs, frequently involve international staff mobility.

As a complement to staff mobility, the free cross-border flow of data is also key for the company's services offer: many of its maintenance and lifecycle services require its staff to perform remote access services. For example, if customers face a problem with the company's medical equipment, the company's maintenance staff can connect to the faulty piece of equipment remotely via the Internet to see what is wrong. However, regulations in some countries do not allow medical equipment to be connected to the Internet. In such cases, the company must send somebody on site to solve the problem, which is both more costly and more time-consuming. Other issues the company faces in this regard relate to the lack of harmonised regulatory standards for the storage of medical data, including privacy or anonymisation requirements. As the company aims to adhere to the same standard globally to ensure the interoperability of its systems, it applies the strictest standard everywhere, which may preclude certain functions.

Finally, working with the same external services providers in as many countries as possible helps the company ensure a consistent service quality globally while at the same time meeting local market expectations. For its customer support operations related to medical and personal care, for example, the company works with a business process outsourcing firm that has offices worldwide, as well as own personnel.





## EXAMPLE:

# POWERPLANTS AND MARINE ENGINES

This company is a leading provider of smart technologies and complete lifecycle solutions for the marine and energy markets. Its integrated portfolio of innovative and efficient services, systems and products maximises the environmental and economic performance of the vessels and power plants of its customers. The company's marine business enhances the operations of its marine oil and gas industry customers by providing innovative products and integrated customised solutions that are safe, environmentally sustainable, efficient, flexible and economically sound. Its energy business solutions comprise engine-based flexible power plants, hybrid solar power plants and energy storage and integration solutions.

## THE ROLE OF SERVICES IN THE COMPANY'S OPERATIONS

The internal and external services the company buys and supplies enable it to differentiate its products from those of competitors and to provide high-quality solutions at reasonable prices: the company supports customers over the lifecycle of its installations and products with services that enhance efficiency and guarantee high-level performance. Moreover, services enable the company to standardise its way of working worldwide, ensuring high-quality, timely, effective and efficient processes. Finally, the possibility to outsource non-core operations to specialised external services providers reduces its operating costs. Some examples of key services functions are listed below:

- ◆ The company delivers additional services alongside many of its products – for instance, hardware sold with variable software solutions and helpdesk user support;
- ◆ The product-as-a-service business model allows customers to lease a product or subscribe to a menu of services the product can deliver instead of buying it. This boosts the profitability of the company's products, improves customer engagement and creates new lines of business;
- ◆ The company's EU-based service centre supports the company's subsidiaries globally in financial accounting and other operational tasks;
- ◆ Its HelpDesk is the first point of contact for all IT service and repair needs globally. As it is based in the USA, the UK and Singapore, it can operate 24/7 and 365 days a year;
- ◆ Its R&D activities are based on long-term cooperation and partnership agreements with research institutions from within and outside the EU;
- ◆ Its EU-based global logistics services centre uses services by external transportation and logistics providers for the distribution of its products;
- ◆ Retail services delivered by external distributors and agents help the company sell its products.





The weight of services becomes even more evident when looking at the company's workforce: almost two thirds of its staff work in services-related jobs. With 39.6%, the biggest category is customer-related services while back-office services make up 16.2% of jobs.

## SERVICES TRADE AND EU FTAs

The company has over 200 locations in more than 80 countries around the world. While its production sites are mostly located in Europe and Eastern Asia, the company has offices for service delivery on all continents. Accounting for 36% of its net sales, Asia is the company's biggest market, followed by Europe (29%), the Americas (24%) and Africa (5%). For setting up subsidiaries in non-EU countries the most common problems the company has faced include foreign equity limits and joint-venture demands (e.g. China), requirements on the number of locals in senior positions (e.g. Ecuador) and on local sponsors (United Arab Emirates), as well as local content requirements (e.g. Brazil, several African countries). Due to the frequent lack of local expertise, local content requirements are particularly hard to reconcile with customers' need for expedited special maintenance services.

Delivering the same quality products and services to customers in more than 80 countries does not only require local presence but also the frequent temporary movement of employees with the necessary technical skills and knowledge between countries. Restrictive regulations in non-EU countries for temporary entry of the company's EU employees to perform unit installation, commissioning, supervisory or maintenance work as well as technical consulting, information technology or training services are amongst the most common barriers the company encounters in this regard. Moreover, the professional qualifications of its EU employees – particularly civil engineers, electrical engineers, architectural engineers and building engineers – are often not recognised in non-EU countries. In the United States, for example, engineering is a regulated profession and licensure of professionals is governed by the individual states. In Canada, on the other hand, engineering is a self-regulated profession governed by a different regional engineering association in each province. Such differing local practices often oblige the company to resort to qualified domestic engineers or engage a local engineering company to process and submit technical specifications and drawings to customers and stakeholders. Mutual recognition agreements for the relevant professional qualifications would therefore facilitate the company's global operations.

### Example: Remote support services

The company offers real-time remote support services for its ship engines. Via the Internet connection of the customer's vessel, experts can connect directly to the vessel's systems and employ advanced diagnostic tools to support the crew with troubleshooting activities and rapid fault resolution. This can also help minimise operating expenditure and lifecycle costs by enabling preventive interventions that avoid costs resulting from unexpected downtime or expensive repairs and on-site visits later. The company's experts can communicate with the crew in real time via a live video link, or review footage shot by crew members on a mobile device. Via an app, the solution uses augmented reality technology to support the rapid resolution of problems.

The company's integrated portfolio of innovative services, systems and products builds on the Internet of Things, artificial intelligence and the availability of fast Internet (preferably 5G) networks. By collecting and evaluating large amounts of data from its customers' facilities and using data analytics and artificial intelligence to support customer business decisions, the company optimises the performance of its installations globally. This requires free and uninterrupted data flows across international borders as well as intelligent connectivity between e.g. satellite technology, artificial intelligence, machine learning technologies, data-driven ecosystems, human machine interfaces and regulatory regimes.

For its outsourced services, the company tries to work with the same service providers globally. This includes firms in the transportation and logistics sector, financial institutions, insurance underwriters, credit card companies, law firms, etc. Liberal services provisions in multilateral, bilateral and regional trade agreements enable these firms to offer the same service in different locations more easily and economically. Therefore, the company benefits from these also indirectly. However, the current uncertain geopolitical situation has a negative impact on the company's relations with external services suppliers: economic sanctions, for example, complicate the cooperation with some financial services providers while the expected legal changes resulting from Brexit may disrupt the company's business relationship with UK-based insurance underwriters.





## EXAMPLE: DENTAL EQUIPMENT

This leading dental equipment manufacturer produces high-tech dental equipment, such as dental units, 2D and 3D X-ray and imaging devices, computer-aided design and manufacturing solutions and software. Working in close cooperation with leading universities and institutes, the company is a recognised pioneer and innovation leader in dental technology: its integrated software platform allows to connect all dental equipment inside a clinic, offering a rich selection of tools and features that can be adapted to all kinds of customer needs.

### THE ROLE OF SERVICES IN THE COMPANY'S OPERATIONS

The integrated high-tech solutions the company offers to its customers are very research-intensive. Adapting to changing market demands and the latest technology requires a lot of staff working in R&D and design services functions. After a new product has been developed, many more services are necessary before the product can be delivered to the customer. For example, a newly developed cone beam computed tomography imaging device needs to be audited by an external consultant to get necessary licenses and approvals before it can be placed on the market.

Before and after delivery, being close to the customer and constantly adapting the product to their needs is key for the company's competitiveness. For this reason, the company works with local dealers in its operations worldwide. These sell, install, repair and maintain the company's products and train and advise end-customers. This cooperation is possible thanks to the sales support and after-sales services – including trainings, warranty case handling and spare parts – the company provides to its dealers. In total, external dealers are responsible for 73% of the company's sales.

Although transport and most distribution, sales and after-sales services are delivered by external services providers, the company provides the bulk of services related to its products in-house, with approximately 40% of its staff working in services. These mostly work in R&D, software development and support, ICT support and maintenance for in-house use, marketing services, financial services and after-sales customer support, with the latter intervening to help dealers in case of more complex problems.

#### **Example: Digital workflow in dentistry**

Digital solutions make dental treatment faster and improve its quality. In case of caries, for example, an intraoral scanner provides the doctor with a digital model of the patient's teeth, which helps identify treatment needs. Based on this model, the doctor can use the company's software to design implants that perfectly fit the patient's needs, along with surgical guides and aligners to help install the implant correctly. These can then be printed with chairside 3D printer while the patient is waiting. Alternatively, the patient's data can be transferred for an external provider to produce these devices.

## SERVICES TRADE AND EU FTAs

The company is active in 120 countries, with considerable market shares in Europe, the Americas and Asia. Its main markets outside the EU are the USA, Australia, Japan, China, Brazil and Russia. To serve these markets, the company frequently sends staff to non-EU countries for contracting clients or managing large installation projects as well as for technical consulting, training and marketing services provided to both clients and dealers. The availability of reliable, affordable and secure data connections allowing its staff to access the company's intranet during these operations is a major challenge.

Data transfers across borders are also key for the services the company supplies alongside its goods: its dental units, for example, constantly send information about their usage to the company's EU headquarters. This data may be combined with patient data, such as X-ray pictures, and helps to identify problems in advance, provide better maintenance and remote repair services, preventing unexpected delays.

For these and other innovative solutions, the company works with software firms from outside the EU: for example, it uses a USA-based cloud service in to keep track of customer data (e.g. installed base, visit notes, services delivered, etc.). As it handles the data of the company's global customer base, the cloud service needs to comply simultaneously with the EU-USA Privacy Shield framework, EU GDPR and different local patient data requirements, which creates a certain degree of uncertainty about compliance and restricts the kind of data that can be stored. Moreover, local restrictions to the free flow of data in different countries complicate the cooperation with global cloud service providers. In China, for example, restrictions such as the requirement for Internet content providers to establish a local distribution point create extra costs and limit the functionality of certain cloud service features (e.g. file sharing) in the country.

Beyond data flows, regulatory challenges in some countries make it difficult for the company to sell its integrated solutions: in Russia and Brazil, for instance, the sale of software as separate service is restricted as software licenses sold as individual items are not recognised at customs.

Challenges also relate to general data security issues the company's customers face: due to tight patient data management regulations in some countries and limited data risk management skills, many dental clinics hesitate to make their intranet accessible from the outside, including through point-to-point service connections or cloud services. They fear security issues like data loss, viruses, malware, fraud could occur, resulting in heavy penalties. This makes them unable to exploit the full potential of the company's equipment.





## EXAMPLE:

# CRANES AND LIFTING EQUIPMENT

This manufacturer of cranes and lifting equipment serves a broad range of customers, including manufacturing and process industries, shipyards, ports and terminals. It provides productivity-enhancing lifting solutions as well as services for lifting equipment of all makes and models. The company is arranged into three business areas:

- ◆ **Industrial equipment:** hoists, cranes and material-handling solutions for a wide range of customers, including industries like waste incineration, paper and forest, automotive and metals production;
- ◆ **Port solutions:** container-handling equipment, equipment for handling bulk, general and project cargo, shipyard handling equipment and heavy-duty lift trucks, backed by a complete range of services. This includes a suite of software products for container terminal operation, warehousing logistics, and consulting services for new container terminal design and container terminal modernisation.
- ◆ **Services:** maintenance and customer support services throughout the lifecycle of its products (see below).

## THE ROLE OF SERVICES IN THE COMPANY'S OPERATIONS

Approximately 50% of the company's employees work in services. While services play an important role in the company's operations overall, they are particularly important in the after-sales phase: the company offers specialised maintenance services and customer support throughout the lifecycle of its products and the products of other brands, providing crane inspections and preventive maintenance, corrective maintenance and retrofits, consultation services and modernisation services. This improves both the safety and productivity of its customer operations. In order to deliver lifecycle care in real time, the company uses the Industrial Internet, connecting data, machines and people. This includes a specialised suite of remote service products and applications to support maintenance operations and drive improvements in safety and productivity.

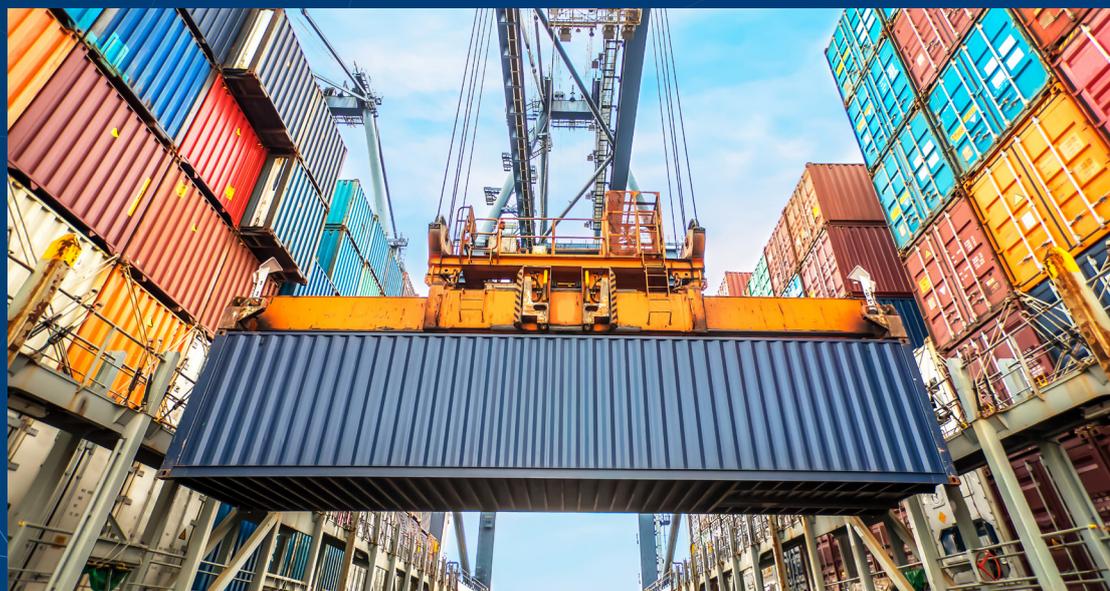
Moreover, the company offers many of its products as a service, helping clients control equipment and maintenance costs. The company's product-as-a-service offer turns cranes from a major investment into a regular monthly expense: with a fixed monthly fee and a minimum contract period of three years, customers get a small- or mid-sized crane with a full service package that includes preventive and routine maintenance, repairs, parts replacement, 24/7 on-call service, and remote monitoring. Only site-related items, transportation, installation, commissioning and initial inspection are paid up-front.

## SERVICES TRADE AND EU FTAs

The company has 600 services locations in 50 countries worldwide and it also has manufacturing activities in several non-EU countries. Its largest market outside the EU is the USA. Amongst the problems it has faced when establishing abroad are discretionary foreign investment screenings, foreign equity limits, joint-venture demands, requirements on the number of host country nationals in senior positions, discriminatory licensing requirements, local content requirements or economic needs tests for establishment.

While the company has local services staff in most locations, its vast offer of maintenance services and the increasing complexity of its product solutions sometimes require the international mobility of its staff for short-term assignments and trainings. To launch IT projects with global roll-out plans, for example, EU-based experts typically need to be sent abroad to help install the new IT system and train local support people to use it. Another typical assignment for which the temporary cross-border mobility of experts may be necessary is major installation projects. Complicated visa and work permit application procedures in many countries can slow down the process. Another challenge in this regard is different national requirements on professional qualifications that, in some cases, make it impossible for the company to use non-local personnel.

Many of the company's operations require the free cross-border flow of both personal and non-personal data. For example, the company provides an online platform service helping its customers to manage their crane portfolio in the most efficient way. For this, it is necessary to store user and equipment information. Current legislation creates both technical architectural challenges and contractual challenges, which need to be tackled through contractual clauses and the separation of user and crane data. Additionally, data localisation requirements and other barriers to the free flow of data, which the company encounters particularly in China and Russia, make the company's business significantly more difficult. Finally, the lack of international harmonisation of data security legislation makes compliance more complex for the company.



While the company provides many of its services in-house, services that are not among the company's core competencies, have a low value-added or are needed only seldomly are outsourced to specialised vendors. The company works both with global (e.g. audit) and local (e.g. telecommunications) external services providers in its worldwide operations. Different local laws regulating the services firms the company works with can increase costs and slow down and complicate its cooperation with them.

### **Example: Predictive maintenance**

Sensors on different crane parts send equipment usage data to the company. Predictive maintenance utilises condition monitoring, advanced inspections, and data analytics to predict component or equipment failure. Analysing and identifying anomalies, patterns and trends in crane usage and operating data helps the company make informed, component-specific predictions, and prioritise recommendations and actions. This can further optimise maintenance activities, reduce unplanned downtime and improve equipment safety, productivity and lifecycle value. Recommendations to repair or replace components are driven by a combination of preventive and predictive maintenance activities. Due to the availability of large amounts of data, the time to perform the analysis is shortened, and the results are inherently more accurate. This enables truly fact-based decision-making when it comes to modernisation or replacement decisions.



**EXAMPLE:****AUTOMOTIVE INDUSTRY**

This automotive supplier develops, produces and sells systems and components for the interior of vehicles, thermal management, the drivetrain as well as for vehicle doors and liftgates. Its mechatronic systems for doors, seats, electric motors and drives enhance vehicle comfort, safety and efficiency. The company delivers mechatronic systems and electric drives to over 80 manufacturers and 40 suppliers.

**THE ROLE OF SERVICES IN THE COMPANY'S OPERATIONS**

Being one of the world's leading automotive suppliers, the company draws on a large array of in-house and external services along the entire value chain of its products to maintain and consolidate this position. The company invests eight percent of its revenue in R&D and heavily relies on engineering services for the development of new products. To produce its products, it does not only rely on its own factories all around the world but also sub-contracts some manufacturing activities through service contracts. Transportation and logistics services as well as financial services are essential for distributing its goods and delivering them to the customer while marketing campaigns, including trade shows, and other public relations services help the company maintain its market share and enter new markets.



## SERVICES TRADE AND EU FTAs

The company has locations in 23 countries in Europe, Asia, the Americas and Africa. Its main markets outside the EU are North America, China, Japan, South Korea, India, South Africa, Brazil, Russia, Turkey and the ASEAN countries.

To guarantee smooth operations worldwide, the company sometimes needs to send EU staff to its locations in non-EU countries or vice versa for temporary assignments. For example, the company sends technicians abroad when new assembly facilities or tools need to be commissioned in one of its own or its suppliers' production sites or when new materials need to be tested as part of a new project. Moreover, the company conducts supplier trainings worldwide to improve the continuous cooperation with its suppliers. For the latter, trainers are either sent temporarily to non-EU countries or new employees from non-EU countries travel to the EU. It is important for the company that its staff can move between countries quickly and without too much bureaucracy. Particularly teething problems require quick reactions and it is often not clear from the start for how long employees need to stay to solve them.

For achieving efficiency gains, the company works with the same financial institutions and logistics firms for its operations all around the world. For example, it manages its processes with the enterprise resource planning (ERP) system of a major software company. As its central ERP system is located in Germany, the company relies on all information, such as customer calls, just-in-time calls or information relating to electronic data interchange, to be exchanged unhindered between EU and non-EU countries. Country-specific regulations, e.g. in China, Brazil or India, can limit the system's functioning in these countries.





## EXAMPLE: WIND TURBINES

This leading supplier of wind power solutions manufactures both on-shore and off-shore wind turbines and provides lifelong services for the installation, maintenance and optimisation of its wind turbines. These services are of immense importance for the company's competitiveness as wind turbines are found in increasingly remote locations all over the world and face enormous environmental pressure.

### THE ROLE OF SERVICES IN THE COMPANY'S OPERATIONS

While a great number of different services are necessary for the company to develop, produce and sell its products, especially maintenance and optimisation services play a key role in its business and are a core area of its activity. Its flexible service portfolio can be tailored to its customers' diverse operating models. On the one hand, these services help customers increase the energy production of their windfarms through intelligent analytics, trainings and knowledge transfer, as well as upgrades and lifetime extension. On the other hand, they reduce costs and financial risk of customers through component and performance warranties and efficient maintenance and repair solutions. Moreover, its innovative offshore logistics services allow customers to access their offshore wind farms.

Besides the services delivered in-house, the company often works with external service providers in its operations. For example, port agents assist with logistics related to vessel loading, unloading or re-fuelling. For the installation and maintenance of its wind turbines, the company works with external high voltage site technicians, blade repair companies, and specialist tooling companies providing e.g. blade yokes or turner tools. Moreover, the company hires external offshore heavy-lift technicians and commissioning supervisors to join its teams during workload peaks.

### SERVICES TRADE AND EU FTAs

The company operates in around 90 countries all over the world. It has services-related activities in 62 of these and manufactures its products in several EU countries as well as in the USA, India, China and Morocco. Moreover, it is preparing for setting up production plants in Turkey and Russia. Its operations are complicated by the fact that local content requirements are increasingly applied in the wind industry. For example, some countries include the requirement to manufacture parts of the equipment locally in public tenders or devise bonus systems giving companies that fulfil certain local content requirements more points in a tender.

For delivering its comprehensive solutions to the customers in non-EU countries, the company frequently needs to send its EU staff abroad for temporary short-term assignments. Some examples are listed hereafter:



- ◆ Senior technicians need to be sent to customer sites to initiate the operation of wind farms after the assembly of the turbines;
- ◆ As part of its maintenance services, the company sends specialist technicians to support customers e.g. with troubleshooting and blade repairs;
- ◆ Offshore heavy-lift operations – e.g. exchanging components in offshore turbines – require the use of jack-up vessels and the cross-border movement of staff able to operate these;
- ◆ The company frequently provides training to customers outside the EU. These require the temporary cross-border movement of EU-based trainers (e.g. technicians, support staff) to support regional staff and training facilities.

The process to get the necessary visas and work permits for these temporary assignments is different for every country and can be very time-consuming. For some countries, the company contracts a third-party agency to assist with the application process.

EU-based staff temporarily working abroad can also create complicated tax issues: recounting the taxes paid in the country where they worked temporarily to the country of residence is complicated as tax offices require data from both countries. The company has experienced tax refunds being withheld or tax being claimed several years after the service in question had been delivered. It can take years until such issues are resolved.

Furthermore, these operations often require not only the cross-border movement of staff but also of equipment, including spare parts. The procedures necessary can be time-consuming.

The recognition of standards internationally is another challenge that complicates service delivery abroad. Therefore, the company is a member of the Global Wind Organisation, which works towards common international standards for safety training and emergency procedures in the wind turbine industry.

Finally, the company's operations would be facilitated enormously if trade in green goods and in services related to the export of environmental goods (e.g. repair and maintenance of wind turbines) were further liberalised and if related non-tariff barriers, such as local content requirements or restrictions on investment, were tackled, e.g. through the WTO Environmental Goods Agreement.





## EXAMPLE: CHEMICALS

This leading chemical company supplies customers with innovative materials and solutions. Its portfolio ranges from chemicals and materials to industrial solutions, surface technologies, nutrition and care and agricultural solutions. It serves customers in almost all sectors, including e.g. the automotive and transportation, agricultural, construction, energy, electronics, textile, cosmetics and pharmaceutical sectors.

### THE ROLE OF SERVICES IN THE COMPANY'S OPERATIONS

Constant innovation is key for the chemical industry. Services help the company to innovate and to tailor its products to the different requirements of its diverse customer base. Its R&D activities include services related to design-thinking workshops or the analysis of big data. In many cases, the company cooperates with universities or research institutions and it also works with external providers of laboratory services to support its in-house researchers. Apart from R&D, a large variety of other services are key to the company's activities. For example, as part of its after-sales services the company uses big data to help customers optimise the use of its products.

As nearly all services are provided in-house, about 65% of the company's staff work outside of direct manufacturing activities. Depending on business needs and on the extent to which in-house control of the related processes is essential or cost-efficient, some services are outsourced, too. For example, logistics services for operations within the company and between plants of the company are performed in-house. Logistics and transport-related operations between the company and partner companies, suppliers or customers, however, are more likely to be conducted by external suppliers. Other areas where the company typically works with external services providers include legal services assisting with mergers and acquisitions, certain financial services, travel management and IT solutions.

### SERVICES TRADE AND EU FTAs

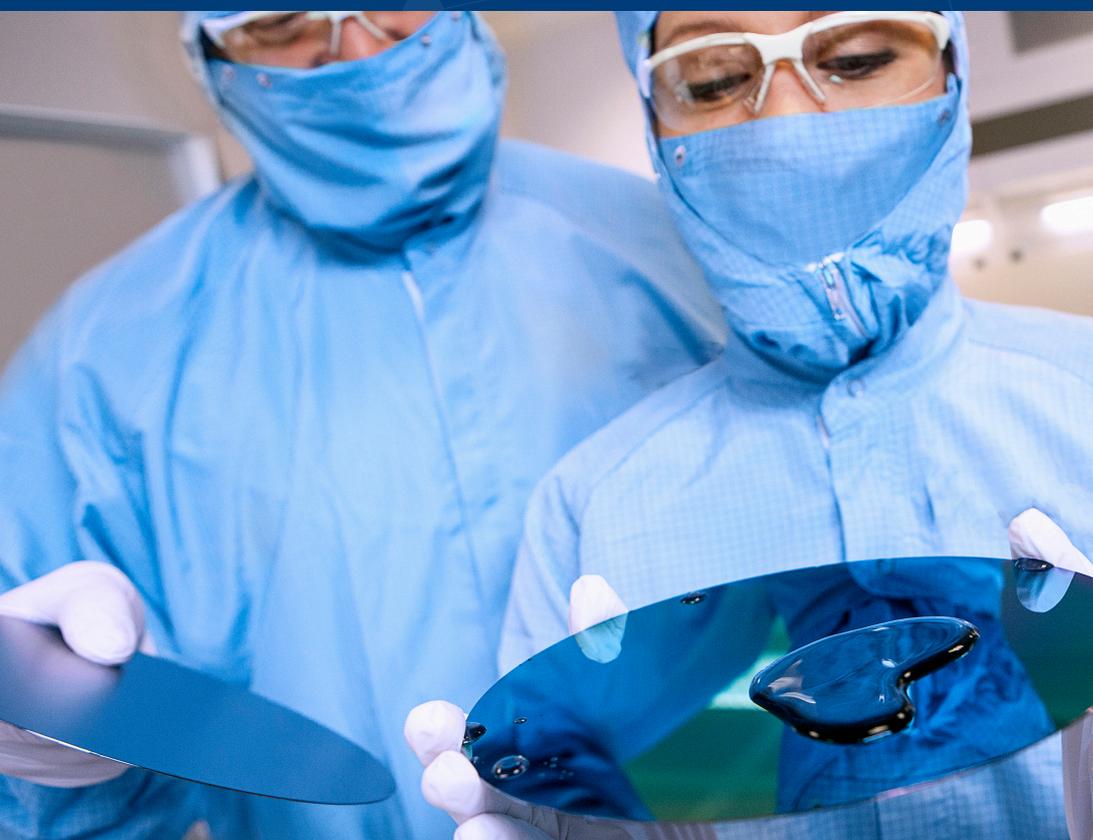
As the company works closely with its customers, local presence is key for its operations. The company has over 350 production sites in more than 90 countries around the world. While the European single market accounts for over 40% of its revenue, its main markets outside the EU are the USA, China, Switzerland, Japan, India, Turkey and Russia.

The company's activities frequently require the temporary movement of staff from its headquarters to non-EU countries to deliver installation, maintenance, technical consulting, training or sales and marketing services. The fact that, particularly in developing countries, qualified labour is often not available to deliver these services, makes the temporary entry and stay of professionals in third countries even more important for the company. However, receiving the necessary visas and work permits can be a cumbersome and lengthy process. It can be so complex that the company is forced



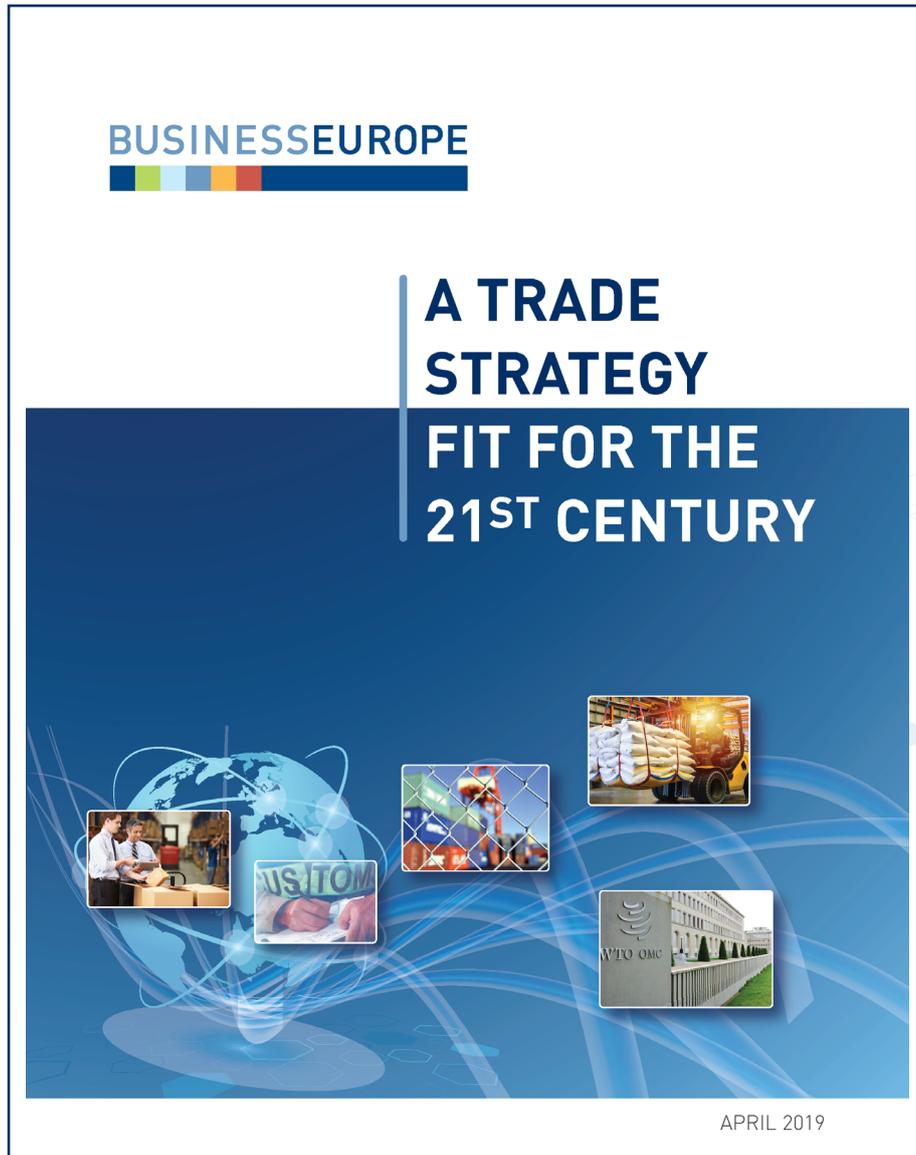
to work with costly local services providers instead. Moreover, temporary operations abroad are significantly more complicated in cases where no agreements to avoid double taxation are in place between the countries concerned.

The free cross-border flow of personal and particularly industrial data is important for the company's internal operations and the services it offers to customers. For example, the company provides real-time services for pest control and the monitoring of plant health to customers in the agricultural sector. The customer is connected to the company's global databases that exploits big data to visually recognise pests, fungi or other plant diseases and advise farmers on optimal plant health management. If national legislation restricts the flow of such data, the company may need to set up national or regional solutions. As less data is available, the quality of this service is significantly lower in such cases. Moreover, if the market concerned is too small to justify the investment into the necessary infrastructure, the company may simply not be able to offer this service there. On a more general level, differences in data privacy regulations as well as different definitions of data and ownership, which are emerging around the world, can constitute barriers to the operations that rely on cross-border data flows.





For further info on trade, you can also read:



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