



European Union
European Regional
Development Fund



REGIONAL ANALYSIS

OF TÂMEGA E SOUSA, PORTUGAL

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1. Introduction

1.1. The Region

Tâmega e Sousa sub-region covers an area of 1,831 km², corresponding to 8.6% of the North of Portugal, and is composed of the municipalities of Amarante, Baião, Castelo de Paiva, Celorico de Basto, Cinfães, Felgueiras, Lousada, Marco de Canaveses, Paços de Ferreira, Penafiel and Resende. With a population of about 415,989, inhabitants, it's density is 236 inhabitants / km², accounting for 4% of the population in Portugal and 12% in the North region, is one of the youngest regions of the country¹.

Geographically, this sub-region presents itself as an area of transition, in Portugal, between the coast - more urban and industrially developed - and the inland - more rural and economically depressed. It is characterized by the increasing concentration of population in urban centers and county seats and the depopulation of rural and remote areas, similar to what happens in the rest of the country. Except for some municipalities, most have a higher population density than the national average value. The heterogeneity of human occupation in the territory is visible, with the municipalities of greater industrial dynamism (Paços de Ferreira, Felgueiras, Lousada and Penafiel) presenting values clearly higher than the rest of the Portugal North region.

Although the business environment is dominated by SMEs, there are large industrial units, generally associated with large foreign investments. The textile industry, particularly footwear, represents a huge engine for industrial development, allowing it a prominent place at regional and national level. The territory also includes the most successful wood and furniture cluster in Portugal².

1.2. The Region Administrative system

Administratively, Portugal, is *de jure* unitary and a decentralized state. Nonetheless, operationally, it is a highly centralized system with administrative divisions organized into three tiers. The State is organized under the principles of subsidiarity, local government autonomy, and democratic decentralization of the public service.

The division of the Portuguese territory is established in title eight of the Portuguese constitution: granting local authority to territorial collectivities with representative organs to affect the interests of the local populations. These collectivities are defined as autonomous regions, administrative regions, municipalities and civil parishes, but reserves the right of urban areas and islands to establish other forms of local authority. In defining the rights and privileges of these entities, the constitution also defines sources of income, that includes local heritage, budgets and equalization transfers from the State, in addition to defining the basic role of local government at each level.

¹ Data from Instituto Nacional de Estatística (INE), available to consult in: https://www.ine.pt/xportal/xmain?xpid=INE&xpgid=ine_indicadores&contexto=pi&indOcorrCod=0008273&selTab=tab0

² Tâmega e Sousa INVEST (2019), Intermunicipal Community of Tâmega e Sousa; Tâmega Sousa Manual for Competitiveness and Innovation (2020), Intermunicipal Community of Tâmega e Sousa; Atlas of Internationalization of Tâmega e Sousa (2019), Intermunicipal Community of Tâmega e Sousa, pp.14-17.

The intermunicipal community (Portuguese: *Comunidade Intermuni* administrative division in Portugal. Since the 2013 local government reform, there are 21 intermunicipal communities. They have replaced the urban communities, the intermunicipal communities for general purposes and some metropolitan areas that were created in 2003 and abolished in 2008. The territories of the intermunicipal communities are the basis of the NUTS III statistical regions.

The branches of administration of the intermunicipal community are the intermunicipal assembly, the intermunicipal council, the intermunicipal executive secretariat and the strategic board for intermunicipal development. The intermunicipal assembly is composed by elected members of the municipal assemblies of the municipalities. The intermunicipal council is composed by the presidents of the municipal chambers of the municipalities.

The Comunidade Intermunicipal do Tâmega e Sousa (CIM-TS) is an administrative division in the Northern Portugal. It was created in 2009. Since January 2015, Tâmega e Sousa is also a NUTS3 subregion of the Norte Region, that covers the same area as the intermunicipal community. The head office of the intermunicipal community is located in Penafiel. Tâmega e Sousa comprises parts of the former districts of Aveiro, Braga, Porto and Viseu. Its main aim is to represent and implement interests of the municipalities of the Tâmega e Sousa sub-region.

1.3. Transport Infrastructure

The region is served by a road and rail network that takes a predominantly east-west direction. The main road link is made up of the A4 motorway, being this road connection the main route of interregional communication, allowing the connection, to the west, to the city of Porto and, to the east, to the interior of the North Region and Spain. In addition to this connection, the A42 motorway also stands out, which guarantees the connection to the A3 motorway, and the A11 motorway, with connection to the A7 motorway, in the direction of Felgueiras, both with connection to the A4 motorway.

The rail connection is guaranteed only by the Douro railway line with the service of CP - *Comboios de Portugal*, through suburban trains from Porto to Marco de Canaveses. Regional and inter-regional services also serve the municipality of Baião. Despite the expectation of reopening the Tâmega railway line, it is currently closed.

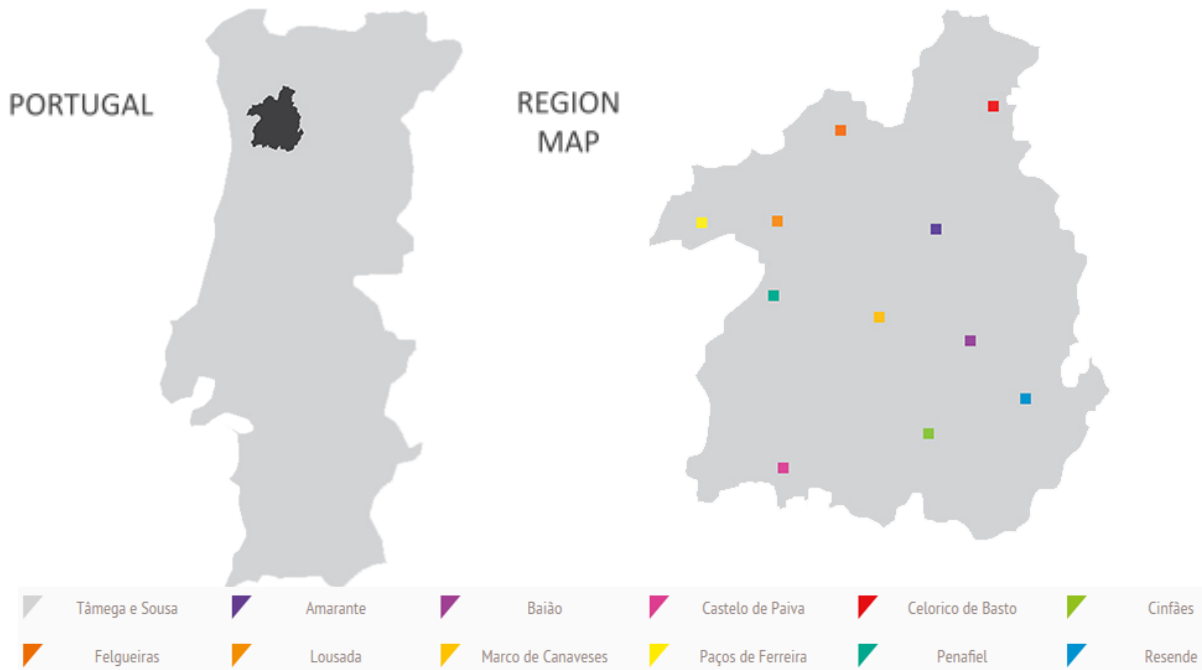
1.4. Digital Infrastructure

There is no disaggregated information for Tâmega e Sousa related to digital infrastructure, so the data to be presented concerns Portugal as a whole.

Portugal ranks 12th in the Connectivity dimension of DESI 2020. It has very good VHCN broadband coverage of 83% (against an EU average of 44%) and good fast broadband (NGA) coverage (83%), which is close to the EU average. Portugal ranks 2nd in at least 100 Mbps fixed broadband take-up (56% compared to an EU average of 26%) but continues to lag behind the EU average on mobile broadband take-up rates despite substantial improvement (from 70 subscriptions per 100 people in 2018 to 76 in 2019). Overall fixed broadband take-up rose from

74% in 2018 to 75% in 2019, narrowing the gap with the EU average (78% in 2018 and 79% in 2019) as 10 municipalities are higher than the EU average ranking 24th in DESI. Mobile 4G coverage has reached 96%, at the same level as EU average.³

Figure 1 - Map of the Tâmega e Sousa region and its municipalities



Source: <http://www.cimtamegaesousa.pt>

1.5. S2E - Job and entrepreneurship Incentives System

S2E - Job and entrepreneurship Incentives System, was launched in the context of support from Portugal 2020 with the main objective of promoting entrepreneurship and job creation. In the Tâmega e Sousa region, it was implemented with funds from NORTE2020, through the ERDF and the ESF, and was managed by Local Action Groups, and by the Tâmega e Sousa Intermunicipal Community.

2.5.1. Objectives

The plan supported aims to stimulate small businesses in the Tâmega e Sousa region, to rise investment in low-density areas, to the creation of micro and small enterprises or the expansion and modernization of existing micro and small companies.

2.5.2. Beneficiaries

Small and micro enterprises within the meaning of Recommendation No. 2003/361 / EC, of the European Commission, of 6 May, on the definition of micro, small and medium-sized enterprises.

³ European Commission, DESI 2020 Portugal. Retrieved from: <https://ec.europa.eu/digital-single-market/en/scoreboard/portugal>

2.5.3. Eligibility criteria

Operations included in all economic activities, except those that include:

- The fisheries and aquaculture sector;
- The sector of primary agricultural production and forests;
- The sector for processing and marketing agricultural products listed in Annex I to the Treaty on the Functioning of the European Union and the processing and marketing of forest products;
- Projects to diversify activities on agricultural holdings, under the terms of the Partnership Agreement;
- Projects that focus on the following activities provided for in CAE - Rev.3:
- Financial and insurance - divisions 64 to 66 of section K;
- Defense - subclass 25402, of class 2540, of group 254, of division 25, of section C; subclass 30400, of class 3040, of group 304, of division 30 of section C; subclass 84220, of class 8422, of group 842, of division 84 of section O;
- Lotteries and other betting games - division 92 of section R.

Projects that include investments resulting from obligations foreseen in concession contracts with the State (Central or Local Administration) are not eligible.

2.5.4. Types of operation

The following types of operations are eligible for financing from SIE:

- Creation of micro and small companies or expansion or modernization of micro and small companies created less than five years ago;
- Expansion or modernization of micro and small companies created more than five years ago.

2.5.5. Eligibility of Expenses

The following expenses are considered eligible, for the purposes of physical investment, in the ERDF component:

- Costs for the acquisition of machinery, equipment, installation and transportation;
- Costs of purchasing computer equipment, including the software necessary for its operation;
- Standard software or developed specifically for the company's activity;
- Design and registration costs associated with the creation of new brands or collections;
- Initial costs associated with the domiciliation of applications, initial subscription to electronic platforms, initial subscription of applications in “software as-to-serve” regimes, creation and initial publication of new electronic content, as well as the inclusion or cataloging in directories or engines search;
- Architectural and engineering services related to the implementation of the project;

- Rolling stock directly related to the exercise of the activity in which execution of the operation, subject to limitations in terms of the proportion of the total investment to be defined in the notices for opening applications;
- Studies, diagnoses, audits, marketing plans and architectural and engineering projects essential to the investment project subject to limitations in terms of the proportion of the total investment to be defined in the notices of opening of applications;
- Renovation or adaptation works, provided they are contracted from third parties not related to the beneficiary receiving the support, which are indispensable for the completion of the investment, subject to limitations in terms of the proportion of the total investment to be defined in the notices for the opening of applications;
- Participation in fairs and exhibitions abroad subject to limitations regarding the proportion of the total investment to be defined in the notices of opening of applications;
- Costs for renting space, including services provided by the organizers of the fairs, namely those related to the consumption of water, electricity, communications, inserts in the fair catalog and translation / interpreter services;
- Costs with the construction of the stand, including the services associated with the design, construction and assembly of exhibition spaces, namely the rental of equipment and furniture, transport and handling of displays, materials and other promotional supports;
- Costs of operating the stand, including travel and accommodation services for company representatives and other representation expenses, as well as hiring translators / interpreters outside the organization of the fairs.

For the purposes of job creation, in the ESF component, expenditure on the remuneration of jobs created is considered eligible, in the following situations:

- Creation of own employment;
- Creation of jobs for unemployed people registered for more than 6 months at the Institute of Employment and Professional Training, I. P. (IEFP, I. P.), including long and very long term unemployed;
- Creation of jobs for young people up to 30 years old looking for their first job, enrolled in IEFP, I. P., as unemployed for at least 2 months.

The following expenses are considered ineligible in the ERDF investment component:

- Purchase of real estate, including land;
- Transfer and space usage rights;
- Acquisition of motor vehicles, aircraft and other transport or aeronautical material that are not included in paragraph g) of paragraph 1 of article 10;
- Acquisition of goods in a state of use;
- Interest during the investment period;
- Working capital;
- Company work for itself;

Beneficiary's operating expenses, running and maintenance costs, except:

- Costs related to export-related activities, namely those directly associated with exported quantities, the creation or operation of distribution networks abroad or other current costs linked to export activity;
- Expenses paid under contracts made through intermediaries or consultants, in which the amount payable is expressed as a percentage of the co-financed amount or the eligible expenses of the project;
- Tax on recoverable added value even if it has not been or will not be effectively recovered by the beneficiary.

2.5.6. Form of support

Non-refundable grant.

2.5.7. Support level

Investment:

- In low-density territories, the level of support is 40% of the total eligible investment.
- In other territories, the level of support is 30% of the total eligible investment.
- The base rate is increased by 10% applicable to projects of the types “Creation of micro and small companies” and “Expansion or modernization of micro and small companies created less than five years ago”.

To employment:

- Funding for the creation of jobs for unemployed or young people looking for their first job or for the creation of their own job provided through the total share of the remuneration of jobs created and the monthly limit is the value corresponding to the Job Index. Social Support (IAS), observing the following maximum periods:
 - 9 months, for open-ended employment contracts or job creation;
 - 3 months, for fixed-term employment contracts, with a minimum duration of 12 months.

To the aforementioned maximum periods are increased by 3 months for each of the following situations:

- Business creation projects provided for in paragraph a) of article 6 of the SI2E;
- For underrepresented gender workers or skilled workers.

2.5.8. Support limit

The maximum limit of ESF and ERDF support to be granted, per beneficiary, for a period of three years cannot exceed the limit of € 200,000.

2.5.9. Fund appropriations to grant

The global allocation of the ESF and ERDF funds allocated to this call is 7 million euros, corresponding to the following indicative allocations by investment priority:

- ESF - 5,300,000.00 €
- ERDF - 1,700,000.00 €

1.6. Economic development and entrepreneurship

Considering the figures presented in table 1, firstly, it is important to mention that data presented varies on local (Tâmega e Sousa), regional (North) and national level. The local dimension has been stable in terms of area, but decreasing in the number of inhabitants. It is also relevant to mention that one of the distinctive attributes of this territory is related to its youth. This is an aspect of identity that remains but is losing strength. Indeed, the available data show that the absolute situation has worsened even if the relative situation of the territory remains is a favourable situation in the context of the North Region and Portugal.

On what concerns GDP the figures show an apparently favourable situation. However, the Tâmega e Sousa region is still lagging on the context of the northern region. In 2018, the northern region was the Portuguese region (NUTS II) that presented the higher growth, but in North, Tâmega e Sousa, was the one with the lowest growth.

Considering the number of companies and employment in this region, the situation has been stable. However, it expected a very negative impact, in particular on what regards unemployment, due to the economic deceleration caused by Covid-19.

Table 1 - General information, 2014-2019

Indicators	2014	2015	2016	2017	2018	2019
Size of territory <i>square kilometres</i> https://www.pordata.pt/DB/Municipios/Ambiente+de+Consulta/Tabela Tâmega e Sousa	1 832	1 832	1 832	1 832	1 832	1 832
Population <i>Total</i> https://www.pordata.pt/DB/Municipios/Ambiente+de+Consulta/Tabela Tâmega e Sousa	425 588	423 683	420 854	418 768	417 268	415 989
Real GDP per capita <i>EUR</i> <i>GDP per capita is a measure of region's or country's economic output that accounts for its number of people. It divides the country's gross domestic product by its total population and is a good measurement of a standard of living.</i> North Region of Portugal according to Eurostat	13 900	14 600	15 200	16 600	16 900	N. A.
Real GDP growth	0.8	1.8	2.0	3.5	2.6	2.2

<p><i>% change</i></p> <p><i>Constant price estimates. In theory, the price and quantity components of a value may be identified and base periods prices are substituted for those of the current period. Methods are used in practice to calculate variables at constant prices. Another method, commonly referred to as price deflation, involves dividing price indexes into the observed values to obtain volume estimates. The price indexes used are constructed from prices of the major items of each value. Please make sure these series are in line with "GDP at constant prices".</i></p> <p>Portugal according to Eurostat https://ec.europa.eu/eurostat/databrowser/view/tec00115/default/table?lang=en</p>						
<p>Population of active enterprises (from 1 to 9 employees)⁴ <i>number</i></p> <p>Tâmega e Sousa</p>	10 108	10 230	10 281	10 417	N. A.	N. A.
<p>Population of active enterprises (10 employees and more)⁵ <i>number</i></p> <p>Tâmega e Sousa</p>	2 190	2 332	2 392	2 449	N. A.	N. A.
<p>Net business population growth⁶ <i>%</i></p> <p>Portugal</p>	0.22	2.81	2.73	3.85	N. A.	N. A.
<p>Unemployment rate <i>% of labour force</i></p> <p><i>Percentage of the civilian labour force which is unemployed. The government defines unemployed as people who are jobless, looking for jobs, and available for work. Unemployed persons comprise persons aged 15 to 64 who were: without work during the reference week, i.e. neither had a job nor were at work (for one hour or more) in paid employment or self-employment; currently available for work, i.e. were available for paid employment or self-employment before the end of the two weeks following the reference week; actively seeking work, i.e. had taken specific steps in the four weeks period ending with the reference week to seek paid employment or</i></p>	11.5	9.8	9.1	7.7	6.3	5.4

⁴ Please, use: https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=bd_size_r3&lang=en

⁵ Please, use: https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=bd_size_r3&lang=en

⁶ Please, use: https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=bd_size_r3&lang=en

<p><i>self-employment or who found a job to start later, i.e. within a period of at most three months.</i></p> <p>https://www.pordata.pt/DB/Municipios/Ambiente+de+Consulta/Tabela</p> <p>Tâmega e Sousa</p>						
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The economy in *Tâmega e Sousa* has a profile that is clearly different from that seen for the Portuguese economy as a whole and even in relation to the North Region. Considering the data from the Regional Accounts (INE), there is a relative weight of the secondary sector that is much higher than that observed both in the country and in the region and a lower tertiarization when compared with the two territorial units of reference. Still, the primary sector has a very low weight in the sectoral structure of the region.

An analysis by municipalities⁷ reveals strong intra-regional disparities, with the municipalities of Felgueiras, Lousada, Paços de Ferreira and Penafiel having a higher weight in the Manufacturing Industry and, additionally, having a high weight in the economic activity of NUT III. As for the municipalities of Celorico de Basto and other municipalities of “Douro Verde” (Baião, Castelo de Paiva, Cinfães and Resende) these have less economic relevance and, apart from Celorico de Basto, the lowest levels of industrialization. In turn, the municipality of Amarante and Marco de Canaveses are in an intermediate situation both in terms of economic relevance and the relative weight of the manufacturing industry.

Thus, *Tâmega e Sousa* presents levels of apparent labour productivity, as seen in the data presented in table 1, significantly lower than those observed both in the country and in the northern region, due either to the low expression of high added value services or to its specialization in the manufacturing industry.

In addition to its strong specialization in the secondary sector, the other major structural feature of the *Tâmega e Sousa* economy is the strong insertion in the international trade in tradable goods, accompanied by a very concentrated pattern of product specialization, such as footwear, textile and apparel, furniture, metalworking, construction and materials or green wine - “vinho verde”⁸.

In 2019, the *Tâmega and Sousa* region had a volume of goods exportations of 1,718 million EUR and a volume of goods importations of 745 million EUR. The coverage rate is very high, with regional exports accounting for more than double of the imports. However, it should be noted that this indicator at regional and sub-regional level may be influenced by the use of intermediaries in import operations that are outside the region.

Tâmega e Sousa has a share of 7.47% in the total of goods exports in the North Region (2019), which is globally in line with the share of the region for the remaining indicators of economic activities in the North Region - 7.4% of turnover and 8.2% of GVA.

⁷ Centro de Estudos de Gestão e Economia Aplicada da Católica Porto (2014); Comunidade Intermunicipal do Tâmega e Sousa (2019).

⁸ *Tâmega e Sousa INVEST* (2019), Intermunicipal Community of Tâmega e Sousa, pp. 1-19.

1.7. Digital economy and society

Table 2 - DESI index and DESI areas, Portugal, 2014-2020

Indicators	2014	2015	2016	2017	2018	2019	2020
DESI Index	0.44	0.49	0.53	44.6	44.8	47	49.6
DESI: connectivity	0.51	0.59	0.62	49.9	44.3	48.4	53.9
DESI: human capital/digital skills	0.4	0.39	0.48	34.2	36.2	35.2	37.7
DESI: use of internet services by citizens	0.4	0.44	0.45	39.6	43.2	45.2	48.1
DESI: integration of digital technology by business	0.33	0.37	0.43	41.8	40.3	41.4	40.9
DESI: digital public services	0.56	0.67	0.7	61.9	67.4	73.4	75.1
DESI: research and development ICT	There is no country measurement or index. Just an European (global) report						

Source: DESI Country Reports 2014 -2020 –

<https://ec.europa.eu/digital-single-market/en/scoreboard/portugal;>

<https://ec.europa.eu/digital-single-market/en/desi>

Portugal ranks 19th out of the 28 EU Member States in the Digital Economy and Society Index (DESI) 2020. Over the last few years, and based on data prior to the pandemic, its score has increased in line with the EU average.

In 2019, Portugal continued implementing the national initiative on digital competencies INCoDe.2030. In parallel, Portugal launched the second phase of the *Indústria 4.0*, a national strategy for the digitisation of the economy with €600 million in total funding over the next 2 years. In addition, two relevant strategies on Artificial Intelligence and advanced computing were launched. Both are strongly focused on improving advanced digital skills. One of the new government four strategic challenges is building up a digital society. The Secretary of State for Digital Transition under the Ministry of Economy and Digital Transition monitors the implementation of the interministerial measures of this challenge” (DESI, 2020).

On what regards integration of digital technology by business, Portugal presented a negative tendency last year, this might be justified by the fact that “generally, Portuguese SMEs are less active in digitisation than their larger counterparts. This is particularly significant because the Portuguese economy is mostly dominated by micro enterprises concentrated on traditional sectors. One of the main obstacles for the digitisation of SMEs is the digital knowledge gap, which is caused by low levels of digital literacy among owners, managers and employees, as showing the results of DigiBEST survey (see Section 7).

The Table 3 below reflects the statistical data available on the general regional digital economy and society available from the Eurostat database.

Table 3 - General regional digital economy and society statistics, 2014-2019.

Indicators	2014	2015	2016	2017	2018	2019
Households that have internet access at home ⁹ <i>% of households with at least one member aged 16 to 74</i> <i>The access of households to internet is measured as percentage of households where any member of the household has the possibility to access the internet from home.</i>	63	67	72	74	77	78
Households that have broadband access by NUTS 2 regions ¹⁰ <i>% of households with at least one member aged 16 to 74</i> <i>The availability of broadband is measured by the percentage of households that are connectable to an exchange that has been converted to support xDSL-technology, to a cable network upgraded for internet traffic, or to other broadband technologies.</i>	61	64	70	74	74	74
Individuals regularly using the internet by NUTS 2 regions ¹¹ <i>% of individuals 16-74</i> <i>Regular users of the internet are persons who use the internet on average at least once a week, every day or almost every day.</i>	55	60	63	66	66	67
Individuals who have never used a computer by NUTS 2 regions ¹² <i>% of individuals 16-74</i> <i>Persons who have never used a computer (at home, at work or any other place).</i>	32	29	28	N.A.	N.A.	N.A.
Individuals who accessed the internet away from home or work ¹³ <i>% of individuals</i>	34	43	45	52	56	58
Individuals who ordered goods or services over the internet for private use in the	21	26	25	27	31	34

⁹ <https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tgs00047&plugin=1>

¹⁰ <https://ec.europa.eu/eurostat/tgm/table.do?tab=table&plugin=1&language=en&pcode=tgs00048>

¹¹ <https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tgs00050&plugin=1>

¹² <https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tgs00051&plugin=1>

¹³ https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_r_iumd_i&lang=en

last year by NUTS 2 regions ¹⁴ <i>% of individuals 16-74</i> <i>Persons who bought or ordered goods or services (i.e. food, groceries, household goods, films, music, books, magazines, newspapers, clothes, sports goods, computer software or hardware, electronic equipment, shares, financial services, insurances, travel or holiday accommodation, tickets, lotteries or betting and other) over the internet during the last year.</i>						
Individuals, who used the internet. ¹⁵ <i>% of individuals</i> <i>Frequency of internet access: once a week (including every day)</i>	55	60	63	66	66	67
Individuals who used the internet, frequency of use and activities ¹⁶ <i>% of individuals</i> <i>Internet use: selling goods or services</i>	6	8	7	6	7	8
Individuals who used the internet, frequency of use and activities ¹⁷ <i>% of individuals</i> <i>Internet use: civic or political participation.</i>	N.A.	60	63	66	66	67
Individuals who used the internet, frequency of use and activities ¹⁸ <i>% of individuals</i> <i>Internet use: Internet banking</i>	20	24	23	24	33	37
Individuals who used the internet for interaction with public authorities ¹⁹ <i>% of individuals</i> <i>Internet use: interaction with public authorities (last 12 months)</i>	35	36	39	40	36	36
Individuals who used the internet for interaction with public authorities ²⁰ <i>% of individuals</i> <i>Internet use: submitting completed forms (last 12 months)</i>	21	22	23	24	23	23

¹⁴ <https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tgs00052&plugin=1>

¹⁵ https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_r_iuse_i&lang=en

¹⁶ <https://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do>

¹⁷ https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_r_iuse_i&lang=en

¹⁸ <https://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do>

¹⁹ https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_r_gov_i&lang=en

²⁰ https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_r_gov_i&lang=en

Individuals who used the internet, frequency of use and activities ²¹ <i>% of individuals</i> <i>Internet use: participating in social networks (creating user profile, posting messages or other contributions to Facebook, Twitter, etc.), percentage of individuals.</i>	63	66	66	66	66	67
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Source: Eurostat database: <https://ec.europa.eu/eurostat/help/first-visit/database>

On what regards to Digitalization, Portugal has already some strengths, but there are still some opportunities to explore. In 2020, Portugal was ranked on the 19th position. According to the DESI indicators, Portugal is doing quite well. The majority of households have access to Internet, and the percentage of individuals that are using internet is quite interesting. The digitalisation of public services also promoted the technological interaction with the government authorities. Platforms such as home banking also promoted the use of technologies. Considering private companies and the business on the web, the figures reveal that there's still a path to do.

Taking into consideration the Digital Scoreboard, the scenario is identical, in some indicators such as Digital Transformation Enabler's Portugal is a bit under the European average. However, in the Digital Technology Integration Index Portugal scores 42,9, while the European average is 37,3. Some results on the Digital Scoreboard for Portugal are presented on the tables below (Table 4 and 5). Currently, there is no available data to compare the situation of the Tâmega e Sousa to other regions in the country.

Table 4 – DTII & DTEI

	Digital Technology Integration Index (DTII)	Digital Transformation Enablers' Index (DTEI)
2018	42,9	48,7
2017	43	70

Table 5 - Digital Transformation Scoreboard

	Digital Infrastructure	Investments and access to finance	Supply and demand of digital skills	e-Leadership	Entrepreneurial culture	ICT Start-ups	Digital Transformation
2018	66	40	34	38	96	70	22
2017	63	26	14	47	71	43	43

Source:

2018: https://ec.europa.eu/growth/tools-databases/dem/monitor/sites/default/files/Digital%20Transformation%20Scoreboard%202018_0.pdf

²¹ <https://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do>

2017: <https://ec.europa.eu/growth/tools-databases/dem/monitor/sites/default/files/Digital%reboard%202017.pdf>

2. Barrier and solution analysis of the digital transforma

The SMEs digital transformation barrier and solution analysis is based on the **literature and document review**. This analysis will be complemented by the Digital Transformation Survey presented in chapter 8.

Table 6 - Barrier & Solution Matrix – Portugal

Title of barrier	Brief barrier description (up to 25 words per each barrier)	Identified solutions, if any (up to 40 words per each solution)	Where to find it in a particular document or publication (e.g. page No., or Table No.)
Awareness Rising & Collaboration			
Work force with low level of digital skills	Need to improve workers' digital skills.	<p>Several actions were identified in order to adapt the format and content of some components of vocational education and training in Portugal, e.g. creation of training offer in i4.0 in higher education (university student), programs “Robots Demonstrators” executed by Institutes of Higher Education (Polytechnic), Learning Factories Promotion, among others.</p> <p>Adjust people's knowledge, through human resource training programs, to allow companies to transition to industry 4.0 and ensuring that it is done in an inclusive manner and based on qualified employment</p>	<p>https://www2.deloitte.com/pt/pt/pages/consumer-industrial-products/articles/industria-4-0-.html</p> <p>https://www.portugal.gov.pt/download-ficheiros/ficheiro.aspx?v=178423e7-fe69-4183-8b19-cdddf612de42</p>
Limited cooperation among SMEs	Limited cooperation across SMEs in integrating in value chains and/or joining up to tackle different markets/products (especially in more integrated sectors)	Define a clear role for clusters and digital innovation hubs as part of a national framework for digitalisation of SMEs	https://cotecportugal.pt/wp-content/uploads/2019/12/digitalisation_of_smes_in_portugal_summary_en.pdf
Low Awareness/knowledge	<p>-General underinvestment vs EU peers (e.g. 20% of SMEs have no investments planned)</p> <p>-General low awareness of the available digital solutions and their benefits to drive demand; where to find?, channels for more sales and</p>		https://cotecportugal.pt/wp-content/uploads/2019/12/digitalisation_of_smes_in_portugal_summary_en.pdf

	<p>efficiency vs transformation of business models;</p> <p>-Lower financial literacy vs EU peers; low awareness of financing options (by SMEs, clusters, DIHs)</p> <p>- Difficulty in signalling the right digital maturity of SME's to relevant stakeholders (e.g. banks, market matchers)</p>		
Enabling Corporate Environment & Capacity Building			
Reduced level of registration of industrial property	The reduced level of registration of industrial property in Portugal, compared to other countries, exposes the business fabric to significant risks, reducing the potential return on investment and technological innovation	In the literature there are no solutions identified for this particular region. However, the proper registration of intellectual property rights associated with investment projects in technological innovation as a source of revenue can be an incentive for new important projects for the digitalization of SME's.	<p>COTEC - Activities Plan 2019 - page 10</p> <p>https://cotecportugal.pt/wp-content/uploads/2019/12/Plano-de-Actividades-2019.pdf</p>
Low level of Digital GDP	In Portugal, it is estimated that digital GDP represents less than 20% of national GDP, clearly below the average of the most developed countries, which is estimated to be in the order of 28% (strategic task to be achieved).	To evolve, the country must continue to be proactive in innovation and evolve at a faster pace in preparing companies and organizations for digital transformation.	https://www.incode2030.gov.pt/sites/default/files/economia_digital_2017_apdc.pdf
Knowledge gaps	from both a business management perspective and a talent/skills perspective (not knowing how and where to apply digital solutions to business processes/channels or how to integrate such digital solutions)	not provided	https://cotecportugal.pt/wp-content/uploads/2019/12/digitalisation_of_smes_in_portugal_summary_en.pdf pp. 10
Low level of digital skills of Human Resources	Need to improve workers' digital skills.	<p>Several programs have been created with the goal of training workers with digital skills.</p> <p>The Government has defined several programs that support this measure, such as "Capacitar i4.0", "Assimilar i4.0" and "Coaching i4.0".</p>	https://www.portugal.gov.pt/download-ficheiros/ficheiro.aspx?v=178423e7-fe69-4183-8b19-cdddf612de42
Administrative & Technical & Legal			
National strategy and	•Coordination/prioritisation difficulties across the schemes		https://cotecportugal.pt/wp-content/up

public support programmes	<p>and transparency of execution levels</p> <ul style="list-style-type: none"> National strategy in place, but not yet defining clear roles across stakeholders, including digital innovation hubs, clusters and associations 		<p>digitalisation of smes in portugal summary_en.pdf pp. 13</p>
Supply of digitalisation	<ul style="list-style-type: none"> Supply is varied but fragmented across technologies, offerings and providers, as well as being asymmetric across sectors; difficult to navigate and often not tailored to SMEs' needs. High-tech start-ups and other tech SMEs with limited interest in supplying and/ or low understanding of the needs of (the large number of) traditional SMEs 	Set up a centralised “yellow pages” repository for digital providers	<p>https://cotecportugal.pt/wp-content/uploads/2019/12/digitalisation_of_smes_in_portugal_summary_en.pdf</p>
Financial & Economic			
Financing gaps	<p>Despite the liquidity available in the banking system and the convergence of access to finance towards the EU average, the digitalisation policy objective is not yet being fully attained. This is the case in particular for SMEs that lack sufficient (physical) collateral, limiting financing for more advanced, larger-scale, and riskier technological projects. This reflects the difficulties encountered by banks in the technical appraisal of projects, as well as the perception of the higher risk of SME lending and digitalisation, in particular (namely, issues with signalling high-potential SMEs and defining adequate pricing). These difficulties continue despite the majority of bank lending being backed up by existing (mutual) guarantee schemes, which are not sufficiently favouring digitalisation so that the benefits are passed on to borrowers.</p>	not provided	<p>https://cotecportugal.pt/wp-content/uploads/2019/12/digitalisation_of_smes_in_portugal_summary_en.pdf pp. 10, 11</p>

<p>Difficult access to financial resources for the digital transition</p>	<p>-difficulties in accessing to financial resources (budget) to support the necessary transformation for digital transition</p>	<p>- Providing credit solutions tailored to companies' financing needs related to implementation of their i4.0 investment plans. -Reformulation of Industry 4.0 vouchers in areas of greater focus. -Opening of new Calls on Information Systems that positively differentiate in their merit, projects that include Industry 4.0 objectives, with i4.0 technology investments Identification, in partnership with European Investment Bank (EIB), of financing solutions to facilitate the implementation of digitization processes in Portuguese SMEs -Disseminate and facilitate access to investment and financing instruments and mechanisms oriented to projects within the scope of i4.0; -Create and adapt funds and support lines to the typology and diversity of projects within the scope of i4.0 digital transformation and the expansion of services and products to the international context. The available credit lines must be promoted with business entities, as well as the tax benefits available to encourage productive innovation, digitalization and internationalization.</p>	<p>11 https://www.portugal.gov.pt/download-ficheiros/ficheiro.aspx?v=178423e7-fe69-4183-8b19-cdddf612de42</p>
Policy & Security			
<p>Technical Capabilities</p>	<p>Need to develop an infrastructure to support the challenges of cybersecurity, responding to the concerns and needs of SMEs to make them digitally resilient.</p>	<p>The government proposes: -Creation of cybersecurity training programs for at least 4 levels: Administration, Management, Management and Operational - Providing SMEs with a help, advice and support service for SMEs elements affected by cyber attacks - Promotion of a collaborative environment</p>	<p>https://www.portugal.gov.pt/download-ficheiros/ficheiro.aspx?v=178423e7-fe69-4183-8b19-cdddf612de42 pp.37</p>

		between companies providing the sharing experiences and best practices	

Sources:

https://cotecportugal.pt/wp-content/uploads/2019/12/digitalisation_of_smes_in_portugal_summary_en.pdf
<https://www.portugal.gov.pt/download-ficheiros/ficheiro.aspx?v=178423e7-fe69-4183-8b19-cddd612de42>

3. Main stakeholders of Tâmega e Sousa's region

A stakeholder is anybody who can affect or is affected by an organisation, strategy or project. They can be internal or external and they can be at senior or junior levels.

During the 1st project semester, the KUMU stakeholders' maps (relationship maps) were developed by DigiBEST partners.

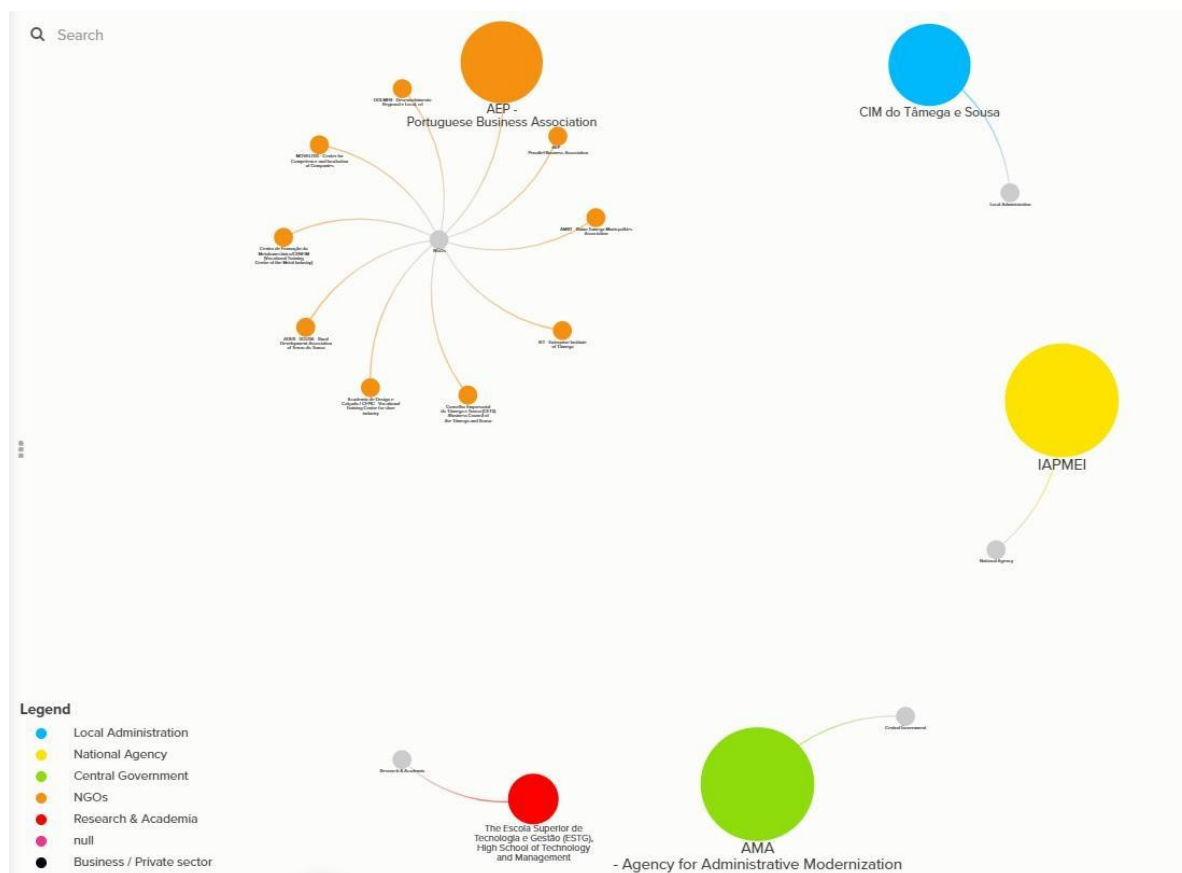
CIM-TS as a regional body of government has great networking diversity with other national, regional, or local entities, as well as in the public or private sectors.

Thus, it was taken advantage of this broad spectrum relational, by having chosen the entities that could best benefit from the potential results of this project, as well as those entities that could best contribute with their experience in the area.

Entities from the following areas were brought to the stakeholder network:

- Research & Academia;
- National Agency;
- Central Government;
- NGOs;
- Local Administration

Figure 2 - Stakeholders map



Source: <https://kumu.io/>

Table 7 - List of stakeholders

Organization	Contact data
CIM do Tâmega e Sousa	https://www.cimtamegaesousa.pt/#/
IAPMEI	https://www.iapmei.pt/
AMA - Agência para a Modernização Administrativa/ Administrative Modernization Agency	ama@ama.pt
Conselho Empresarial do Tâmega e Sousa (CETS) /Business Council of the Tâmega and Sousa	https://www.cets.pt/
The Escola Superior de Tecnologia e Gestão (ESTG), High School of Technology and Management	https://www.estg.ipp.pt/?set_language=en
DOLMEN - Desenvolvimento Regional e Local, crl	https://www.dolmen.co.pt/
IET - Enterprise Institute of Tâmega	https://iet.pt/
AEP – Penafiel Business Association	https://www.aepenafiel.pt/
MOVELTEx– Center for Competence and Incubation of Companies	http://moveltex.com/
ADER - SOUSA - Rural Development Association of Terras do Sousa	https://adersousa.pt/

AEP - Portuguese Business Association	https://www.aeportugal.pt/
Academia de Design e Calçado / CFPIC - Vocational Training Centre for shoe industry	http://www.cfpic.pt/
Centro de Formação da Metalomecânica/CENFIM (Vocational Training Centre of the Metal Industry)	http://www.cenfim.pt/default_v2_en.asp#topo
AMBT - Baixo Tâmega Municipalities Association	http://www.baixotamega.pt/pages/14

Source: Comunidade Intermunicipal do Tâmega e Sousa

4. Tâmega e Sousa's region SWOT analysis

The SWOT Analysis carried out for the territory of Tâmega and Sousa included two groups of factors:

- a. Internal factors – The *strengths* and *weaknesses* internal to the region;
- b. External factors – The *opportunities* and *threats* presented by the external environment to the region.

The SWOT analysis identified the following:

- **Strengths:** characteristics of the SMEs digitalization development, main success factors, strengths with regard to SMEs digital transformation in Tâmega e Sousa.
- **Weaknesses:** factors that present disadvantages for SMEs digital transformation.
- **Opportunities:** chances to improve SMEs digitalization and its economic impact.
- **Threats:** elements for SMEs digitalization that could cause trouble for the economic development.

Table 8 - SWOT analysis.

Internal Factors	
Strengths	Weaknesses
Average market sophistication that brings Tâmega e Sousa fairly to the technology centre.	A very fragmented and small sector of enterprises in the territory of Tâmega e Sousa.
Portugal is viewed as a country particularly interested in new technologies, this interest makes it a good area to the development of the IT industry.	The minor size of the Tâmega e Sousa and Portuguese internal demand market.

A market with active demand for up-to-date information systems	An old-fashioned public administration: difficulties in taking the corporate digitalization engine with policies suited to the sector.
A new generation of Portuguese who offer a qualified, competent and young workforce.	There is a slow progression regarding digitalization of the Tâmega e Sousa region, where even the available public services are only recently has taken the necessary steps to improve
The successful experiences in the use of new technologies and massive dissemination, e.g., MB, POS, via Verde, mobile phones, taxes via the internet.	The past economic crisis has heightened the fear of using bank credit to invest in new systems, such as IT systems, in which the financial return may be uncertain.
Facilitated access to public and community funding for small digitization and internationalization projects of SMEs.	SME managers with limited qualifications which reduces sensitivity to this topic.
Regional cooperation between the incubators/business associations and the regional authorities.	Absence of a culture of cooperation in companies of the same sector, as well as distrust among competitors.
	Little penetration of e-commerce on the enterprise sector of Tâmega e Sousa.
External Factors	
Opportunities	Threats
Very few initiatives for the implementation of digital transformation, so much remains to be done.	Inequality associated with different literacies regarding new technologies, between the most urban and the most rural areas, both at national and region level.
Global demand of goods and products produced on the Tâmega e Sousa region and on Portugal indicating higher growing rates.	The stagnation of public policies that encourage the digitalization of SMEs.
Facilitated access to foreign markets, namely to Portuguese-speaking markets, as well as to the Spanish market due to geographical proximity.	Possible reversal of the economic cycle, this could bring foreign competition to the domestic market and pulverize the local business fabric.
Easy access to the European Union partnerships and programs.	Lack of willingness from some entrepreneurs to change the business paradigm of their companies.
The digitalization of SMEs gives the possibility of creating products and services for the global market and for partnerships with global players.	Danger of labour force drained to more competitive and better paid markets.
The possibility of independence between the operation/business and geographic location or customer distances, thus increasing the possible range of customers.	Inadequate education of the labour force for digitalization needs.
Creation of new skills for employees of SMEs.	
Priority of the EU strategic policies on the digital transformation of the SMEs.	

Source: *Comunidade Intermunicipal do Tâmega e Sousa*

5. Policy on and support instruments for digitalization o

The Northern Region of Portugal stands out, without national and European context, for the low levels of use of electronic commerce. It is the Portuguese region where the population buys less online, and one of the regions in which this indicator has the lowest values (21% in 2013, compared to 47% registered in the EU27). Generally, access to ICT in companies is in line with the EU average. Except for the use of some services by companies, such as the provision of a website, which is below the European average. The use of ICT by workers also stands out as negative in the European context²².

There is a dual situation, in which an increasing number of companies with a strong index of technological sophistication and use of advanced services coexist with a high number of companies with very low levels of technological incorporation, particularly in the SME segment.

5.1. Main features of the national, regional and local policies towards the digitalization of SMEs

The Northern Region is the NUTS 2 with greater openness and export orientation in Portugal (where the territory of Tâmega and Sousa is inserted), being the one that contributes the most to the total of national exports, however it is still below its potential. In fact, only 14,989 SMEs of the total 113,898 in the North Region are exporters, which makes 13.2% of exporting companies²³, thus having a great potential for expanding the export base of the North Region. Regarding the attraction of Direct Foreign Investment, a new trend characterized by the search for the best quality-cost ratio of human capital. Concomitantly, foreign investment by some companies is increasing in the North, especially in large-scale distribution - agri-food and civil construction, which can be supporting elements in a process of “supported” internationalization of regional SMEs. In view of its specialization profile (sectors that produce tradable goods and services), it is crucial to have dedicated instruments to support internationalization that continue to stimulate and leverage dynamic competitiveness factors, in technological intensification, but also in the exploration of new markets, new business models and new internationalization processes, based above all on digitalization.

Innovation activities are, of course, risky. In order to promote innovation and innovative entrepreneurship, it is important to make up for an insufficiency in the regional system and innovation associated with its financing. The supply of risk capital remains scarce and distorted, favouring investments of moderate and low risk. In the current situation, there are still financing problems, which determines the growth, innovation and internationalization (investment) processes of SMEs.

The Ministry of Economy and Digitalization of Portugal, intending to generate the conditions for the development of national industry and services in the digital age, decided to launch an

²² RIS3 Norte 2020 - https://norte2020.pt/sites/default/files/public/uploads/documentos/norte2020_ris3.pdf

²³ RIS3 Norte 2020 - https://norte2020.pt/sites/default/files/public/uploads/documentos/norte2020_ris3.pdf

initiative (Portugal i4.0) to identify the needs of the Portuguese industry measures (public and private) to achieve three central objectives:

- Accelerate the adoption of technologies and concepts of Industry 4.0 in the Portuguese enterprise sector;
- Promote Portuguese technological companies at an international level;
- Make Portugal an attractive hub for investment in the Industry 4.0 context.

As a partner of SMEs in development and innovation, it has once again placed itself next to companies in this new challenge, generating conditions for the development of national industry and services in the new paradigm of the Digital Economy, supporting them in this adaptation, namely through making available a set of incentive systems that aim to modernize and innovate its products, services and business models, making them more competitive in the context of Industry 4.0.

The available incentive systems are divided into three types of action:

- Digital Economy: For digital infrastructure projects, cloud computing and cyber security; Advanced analytics and AI; User-Centered Design; WCM and CRM - Web Content & Customer Relationship Management; E-Commerce and E-Marketplaces; SEO and SEA - Search Engine Optimization / Advertising Social media, content & mobile Marketing; Web Analytics.
- Productive Innovation: For projects of Productive Innovation in Connectivity; Intelligent production processes; Additive production; intelligent machines; Advanced materials; Modular operations; 3D printing; Autonomous robots.
- R & D - Research and Development: For R&D projects in cyber-physical systems; Virtualization and Simulation; Artificial intelligence; Scanning; Augmented Reality and wearables; Nanotechnology and advanced materials; Energy.

Thus, these axes aim to provide potential promoters, the companies that embrace digital transformation, with access to information on the options available in support of the promotion of digital transformation.

Table 9 - Normative acts on national, regional and local levels regulating digitalization.

National level
1. Sistemas de Incentivos à Economia Digital – Indústria 4.0 (Digital Economy Incentive Systems) (POR)
2. Operational Programme, Growth and Employment 2014 - 2020 (ENG)
3. National Digital Competences Initiative e.2030, Portugal (ENG)
Resolução do Conselho de Ministros n° 30/2020 Approves the Digital Transition Action Plan (PT)
Resolução do Conselho de Ministros n° 31/2020 Creates the Portugal Digital Mission Structure (PT)
Quadro Dinâmico de Referência de Competência Digital para Portugal - INCODE 2030 Reference Framework with three major scopes: supporting the definition of policies and strategies, allowing a mapping of digital skills articulated with other references; design education programs, namely for curriculum revision, development of training programs and employability skills; evaluate and certify competences, either by self-diagnosis or by certifying entities.

<p>Despacho nº 1087/2019 Approves the dynamic framework of reference for Digital competence (QDRCD) (PT)</p>
<p>Resolução do Conselho de Ministros nº26/2018 Approves the Program «National Initiative of Digital Skills E.2030» (PT) Good practice: Bottom-up implementation in Indústria 4.0 (PT)</p>
<p>SI I&D Individuais - IAPMEI, I.P. Aims to increase the intensity of R&I in companies and their economic valuation; increase projects and activities in cooperation between companies and other entities in the R&I system; develop new products and services, especially in activities of greater technological intensity and knowledge; reinforce the actions of economic valorisation of successful R&D projects; and increase national participation in international R&I programs and initiatives.</p>
<p>SI Núcleos I&D - IAPMEI, I.P. Aims to increase the intensity of R&I in companies and their economic valuation; increase projects and activities in cooperation between companies and other entities in the R&I system; develop new products and services, especially in activities of greater technological intensity and knowledge; reinforce the actions of economic valorisation of successful R&D projects; and increase national participation in international R&I programs and initiatives.</p>
<p>Vale Oportunidades de Investigação - IAPMEI, I.P. It is intended for projects for the acquisition of services in research and technological development and technology transfer activities.</p>
<p>SI Inovação Produtiva - IAPMEI, I.P. Aims to promote business innovation in the following areas: production of new goods and services or significant improvements in current production through the transfer and application of knowledge; adoption of new or significantly improved manufacturing, logistics and distribution processes or methods, as well as organizational methods.</p>
<p>SI Empreendedorismos Qualificado e Criativo - IAPMEI, I.P. aims to support activities with high added value, with effects inducing changes in the productive profile of the economy, that is, the creation of companies with qualified human resources, companies that develop activities in sectors with strong growth dynamics and or sectors with greater intensity of technology and knowledge or of companies that value the application of R&D results in the production of new goods and services.</p>
<p>Vale Indústria 4.0 - IAPMEI, I.P. Aims to promote the definition of its own technological strategy, with a view to improving the company's competitiveness, in line with the principles of Industry 4.0.</p>
<p>SI Qualificação Individuais - IAPMEI, I.P. Aims to strengthen the entrepreneurial capacity of SMEs through organizational innovation, applying new organizational methods and processes and increasing flexibility and responsiveness in the global market, using immaterial investments in the area of competitiveness (organizational innovation and management, digital economy, creation of brands and design, development and engineering of products, services and processes, protection of Industrial Property, quality, knowledge transfer, distribution and logistics, eco-innovation, professional training, HR contracting).</p>
<p>Program Capacitar i4.0 with the measure “Academias i4.0” - IAPMEI, I.P. Aims to promote a network of academies in companies that develop qualification plans for their active employees in response to the challenges of the 4th Industrial Revolution, in the fields of saber-saber, saber-ser and saber-do, the adjustment times - until the starting a new function and reducing the efficiency of the person and the company, as well as the quality of the product or service.</p>
<p>Program Indústria 4.0 with the measure “Qualificação digital e setorial (formação de quadros de gestão e técnicos)” - COTEC Portugal Aims to implement sectoral training plans that enable the management and technical staff of SMEs to have the necessary skills for i4.0.</p>
<p>Program Indústria 4.0 with the measure “Learning Factories (formação de recursos humanos)” - COTEC Portugal</p>

<p>Aims to provide training mechanisms geared to specific needs and in formats com articulation of the “day to day” of SMEs.</p>
<p>Program Indústria 4.0 with de measure “Coaching i4.0 (ações de formação com componente de financiamento)” - COTEC Portugal</p> <p>Aims to support the integration of technological investment, empower organizations and facilitate organizational transformation.</p> <p>Program Simplex 2019 with the measure “Programa e-Residency - Sistema de Identidade Digital” - AMA</p> <p>Aims to create a concept of digital identity using the Digital Mobile Key (CMD), allowing citizens, nationals or foreigners not resident in the country, to use Portuguese public services in their online version.</p>
<p>Program Indústria 4.0 with the measure “Financiamento e apoio ao investimento (acesso, financiamento e transformação)” - COTEC Portugal</p> <p>The Portugal Indústria 4.0 Program is an initiative of the Portuguese Government whose main objective is to accelerate the adoption of industry 4.0 by the business community.</p>
<p>I&D AI 4 COVID-19: Ciência dos Dados e Inteligência Artificial na Administração Pública - 2020 - FCT</p> <p>Call with the objective is to support R&D projects and initiatives that can contribute to new responses to this and future pandemics, with an emphasis on supporting citizens and health care services.</p>
<p>IC&DT em todos os Domínios Científicos - FCT</p> <p>Call with the objective of promoting and strengthening the skills of scientific and technological institutions through the participation of their teams in IC&DT projects</p>
<p>Regional level</p>
<p>1. SI2E - Job and entrepreneurship Incentives System (POR)</p> <p>SI2E - Incentive Scheme for Entrepreneurship and Employment was launched in the context of support from Portugal 2020 with the main objective of promoting entrepreneurship and job creation.</p>
<p>2. NORTE 2020 (ENG) (<i>implementation ongoing</i>) financing measures related to digital transformation (digital economy, digital public services)</p>
<p>3. Lain Call “Projetos copromoção de I&DT (Parcerias Internacionais - MIT, CMU, UTA)” – CCDR-N - FEDER</p> <p>The program already has the third phase of International Partnerships with Carnegie Mellon University, MIT and the University of Texas at Austin (UT Austin), which started in 2018 and runs until 2023. It intends to attribute to national companies the role of promoting networks and collaborative projects, with the support of Portuguese R&D institutions and the participation in experiences and knowledge of North American universities. The goal is to create a model in which national companies lead the process of modernizing the economic fabric, reforming the innovation ecosystem in Portugal.</p>
<p>4. Call “Investigação e Desenvolvimento (Núcleos IDT)” - CCDR-N – FEDER</p> <p>The specific objective of this call for proposals is to support investment projects in the Investment typology called “Research and Technological Development”, through the granting of financial support to projects that contribute to the increase in business investment in the field of R&D.</p>
<p>5. Call “Projetos copromoção de I&DT - EUREKA-EUROSTARS Articulação com iniciativas europeias” - CCDR-N – FEDER</p> <p>This support seeks to promote the internationalization of national projects and show the most competitive ones through technological monitoring and sharing of costs, knowledge and results between partners from different countries (e.g. benchmarking from other countries in terms of digital transformation).</p>
<p>6. Call “Projetos de I&DT em copromoção” - CCDR-N – FEDER</p> <p>The Incentive System "Research and Technological Development" supports projects of companies in co-promotion with other companies or other entities of the R&I System, which aim at strengthening their competitiveness and international insertion through industrial research and experimental development activities.</p>
<p>7. Call “Inovação Empresarial e Empreendedorismo - Inovação Produtiva” - CCDR-N – FEDER</p> <p>The specific objective of this contest is to provide financing to projects that contribute to increase investment in innovative activities (product, process, organizational and marketing methods), reform or business investment in innovative activities, promotion or increase in tradable and internationalizable production, through the development of innovative solutions used in the results of R&D (research and</p>

technological development) and in the integration and convergence of new tech and also for the creation of professional jobs. As well as for strengthening the entrepreneurial capacity of SMEs for the development of goods and services.

8. Call [“Inovação Empresarial e Empreendedorismo - Empreendedorismo Qualificado”](#) - CCDR-N – FEDER

The specific objective of this contest is to provide financial support for Entrepreneurship projects that contribute to the promotion of entrepreneurship, namely facilitating support for the economic exploration of new ideas and encouraging the creation of new companies (e.g. promotion of projects related with digital entrepreneurship).

9. Call [“Internacionalização PME - Projetos Individuais”](#) - CCDR-N – FEDER

10. Call [“Internacionalização PME - Projetos Conjuntos”](#) - CCDR-N – FEDER

This program aims to strengthen the entrepreneurial qualification of SMEs for internationalization, with a view to promoting the increase of exports through the development and application of new business models and qualification processes of SMEs for internationalization, valuing the immaterial factors of competitiveness, allowing to enhance the increase of its base and export capacity, as well as increase the specific qualification of assets in fields relevant to the strategy of innovation, internationalization and modernization of companies, in order to enhance the development of productive activities more intensive in knowledge and creativity and with a strong incorporation of national added value.

11. Call [“Qualificação PME \(Projetos Individuais\)”](#) - CCDR-N - FEDER

12. Call [“Qualificação PME \(Projetos Conjuntos\)”](#) - CCDR-N – FEDER

The objective of this contest is to provide financial support to projects that strengthen the organizational and management capacities of SMEs, including investment in the development of strategic and competitive management capacities, modern networks for the distribution and placement of goods and services and the use of ICT.

Local level

1. [BBox@Tâmega e Sousa](#)

B.Box @ Tâmega e Sousa is an intensive, pre-acceleration and skills development program for Tâmega e Sousa entrepreneurs and business persons, promoted by the Tâmega e Sousa Intermunicipal Community and the municipal company Qualidade de Basto, with the support of Felgueiras Municipality and with the scientific coordination of the Higher School of Technology and Management of the Polytechnic of Porto, through the Entrepreneur Support Office.

5.2. Support instruments to promote SMEs digitalization

The policy instrument tackled within the DigiBEST project is Job and Entrepreneurship Incentives System with the aim to stimulate small businesses in the Tâmega and Sousa region, valuing investment in low density territories, for the creation of micro and small companies or the expansion or modernization of micro and small companies.

6. SI2E - Job and entrepreneurship Incentives System	Number of SMEs applying for the SI2E support for digital transformation. These SMEs will aim to improve their business through advanced digital technologies and solutions.	20
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We envisage the improvement of policy instrument through the enhanced knowledge produced by the analysis of good practices and information exchange during the Interregional cooperation promoted by the DigiBEST project can inspire and influence necessary improvements for the policy instrument. New practices and methodologies need to be used to better define the calls or the selection process of projects. The SI2E is a very bureaucratic policy measure, thus, demonstrating that it's important to reduce the bureaucracy level and introduce, for instance, the simplified costs, documentation, as well as on site controls *a posteriori*, results' evaluation and avoid the invoice validation and proof of payments, and so on.

We consider that the simplification of the process will help the micro and small enterprises, namely the ones aiming to transform digitally their companies. The complex governance process is an obstacle to the support application by the businesses which aspired to advanced technologies and innovative business models.

6. Analysis and identification of good practices

The good practices presented below, were selected in accordance with the DigiBEST partnership and the Interreg Policy Learning Platform. They create the conditions to improve and empower SMEs to expand or transition to digital technologies. Also, the chosen good practices are being applied in the territory of Tâmega and Sousa by entities headquartered here or active in the territory. Hence, their selection makes perfect sense, so that they can be the target of study by the other partners of the project, enhancing their replication to those who understand them as interesting.

Table 10 – Espaço Empresa

Good practice general information	
Title of the good practice	<i>Espaço Empresa/Business Space²⁴</i>
Category of the good practice	<i>Please choose one of the categories:</i> <i>x Awareness rising and collaboration;</i> <ul style="list-style-type: none"> • Empowering tools; • Sustainability instruments; • Enabling environment; • Other
Organisation in charge of the good practice	<i>Municipality of Paços de Ferreira</i>
Description	
Short summary of the practice	<i>Service designed to support entrepreneurs in the creation and management of their business, in a logic of single point of contact between the government and SME. The entrepreneurs have at their disposal a varied range of digital services, including information about them and a mediated service for licensing processes.</i>

²⁴ <https://www.interregeurope.eu/policylearning/good-practices/item/3924/espaco-empresa-business-space/>

Resources needed	<i>2000 EUR/month for equipment and for Human full-time person and another half time person) this cost is supported by the budget of the municipality of Paços de Ferreira</i>
Timescale (start/end date)	<i>April 2017 – ongoing</i>
Evidence of success (results achieved)	<i>This practice is considered good because of the number of service customers that attended the Espaço Empresa/Business Space. From the beginning until now the Espaço Empresa/Business Space has assisted 700 people in the municipality of Paços de Ferreira, which is a huge number.</i>
Potential for learning or transfer	<i>The Espaço Empresa/Business Space is a service heavily oriented to customers with specific needs to create a small company and/or to solve problems directly related to their small or medium businesses. Being assisted by a specialized technician, help can be found in a very easy manner. By one hand, they have a person to whom the situation can be explained and, by the other, they can address the problem immediately through the digital services. The key success factors are the available specialized technicians, the concentration of different services from different public entities and the digital services available for free. <i>This practice can easily be transferred and implemented to address a wide range of situations, preventing people from visiting a huge number of places to create their business or to solve a problem. All the actors involved have benefits, the public services increase their efficiency and the customers save money and time!</i></i>

Table 11 - Portugal Industry Program 4.0

Good practice general information	
Title of the good practice	<i>Programa Portugal Indústria 4.0 - Estratégia Nacional para a Digitalização da Economia (Portugal Industry Program 4.0)²⁵</i>
Category of the good practice	<i>Please choose one of the categories:</i> <ul style="list-style-type: none"> • Awareness rising and collaboration; x Empowering tools; • Sustainability instruments; • Enabling environment; • Other
Organisation in charge of the good practice	<i>Portuguese Ministry of Economy and Digital Transition (and IAPMEI)</i>
Description	
Short summary of the practice	<i>A Lever to reach the goal of convergence with the EU. Is intended to create good conditions for the development of SMEs in the model of the Digital Economy</i>
Resources needed	<i>I4.0 has a budget of up to 2.26 billion EUR, through PT 2020, for the following instruments: Vale i4.0 (global allocation of 12 M€, will cover 1500 companies, each voucher has a unit value of 7,5</i>

²⁵ <https://www.interregeurope.eu/policylearning/good-practices/item/3925/programa-portugal-industria-4-0/>

	<i>k€); Qualification of SME; Productive Innovation Technological Development” Programs</i>
Timescale (start/end date)	<i>May 2017/ongoing</i>
Evidence of success (results achieved)	<i>95% of the 64 measures defined in the i4.0 program have already been implemented, covering more than 24 thousand companies and 550 thousand people. In the future, it is intended to train 200 thousand more workers and finance more than 350 transformational projects. With an inclusive approach, supported by the know-how of more than 50 public and private entities.</i>
Potential for learning or transfer	<i>The Industry 4.0 Program is a lever for achieving the objective of a decade of sustained economic convergence with the European Union, as part of the National Strategy for Horizon 2030. The progress of the industrial sector and SMEs in industry 4.0 is directly linked to economic growth. The convergence for the group of leading countries in the i4.0 context, may represent an additional GDP growth (in Portugal only) compared to the forecast of 1.8% / year, filling and exceeding the stipulated convergence objective.</i>

Table 13 - Citizen’s Shop

Good practice general information	
Title of the good practice	<i>Loja do Cidadão/ Citizen’s Shop²⁶</i>
Category of the good practice	<i>Please choose one of the categories:</i> <ul style="list-style-type: none"> • Awareness rising and collaboration; x Empowering tools; • Sustainability instruments; • Enabling environment; • Other
Organisation in charge of the good practice	<i>AMA – Portuguese Administrative Modernization Agency</i>
Description	
Short summary of the practice	<i>Citizen’s Shop is a concept of public services that brings together several public and private entities in the same space.</i>
Resources needed	<i>The cost of implementation and management varies with the store’s size, and it can be funded by municipalities budget or by the national government budget, from a few hundred EUR to more than 20k EUR per month. HR costs are not accounted for, as they are guaranteed by the employees’ home services.</i>
Timescale (start/end date)	<i>Since 1999 /ongoing</i>
Evidence of success (results achieved)	<i>Citizen Shop is today one of the most distinctive brands in the relationship of SME’s with Public Administration. At the end of 2011, the service reached 100 million users. The high levels of demand (there are alternatives) that reveal the user’s preference</i>

²⁶ <https://www.interregeurope.eu/policylearning/good-practices/item/3926/loja-do-cidadao-citizen-s-shop/>

	<p><i>for this model of public service provision, with c generally positive evaluations. In 2018 the Territorial coverage rate in Portugal was 19%, compared to the 11% rate for 2013.</i></p>
<p>Potential for learning or transfer</p>	<p><i>In addition to providing comfort and convenience to citizens allowing them to deal with various issues in the same space, with time and travel cost savings, the stores also allow sharing resources, infrastructure and platforms, enhancing efficiency and cost reduction in the Government Body.</i></p> <p><i>All the actors involved have benefits, the public services increase their efficiency and the customers save money and time:</i></p> <p><i>Reducing the number of local offices and posts, which multiply in rents and infrastructure costs;</i></p> <p><i>Sharing infrastructures, platforms and software between some of the present entities;</i></p> <p><i>Benefiting from the presence of private entities, which contribute to the sustainability of the model by covering 33% of total expenses;</i></p>

7. Finding and conclusions of the Digital Assessment Survey

The survey was designed to answer 4 main questions:

- How small and medium businesses (SMEs) proceed towards the digital transformation?
- Why and which digitalization solutions are being mostly used by SMEs?
- Why businesses don't use particular IT solutions or technologies?
- How authorities can help businesses to promote the digital transformation process?

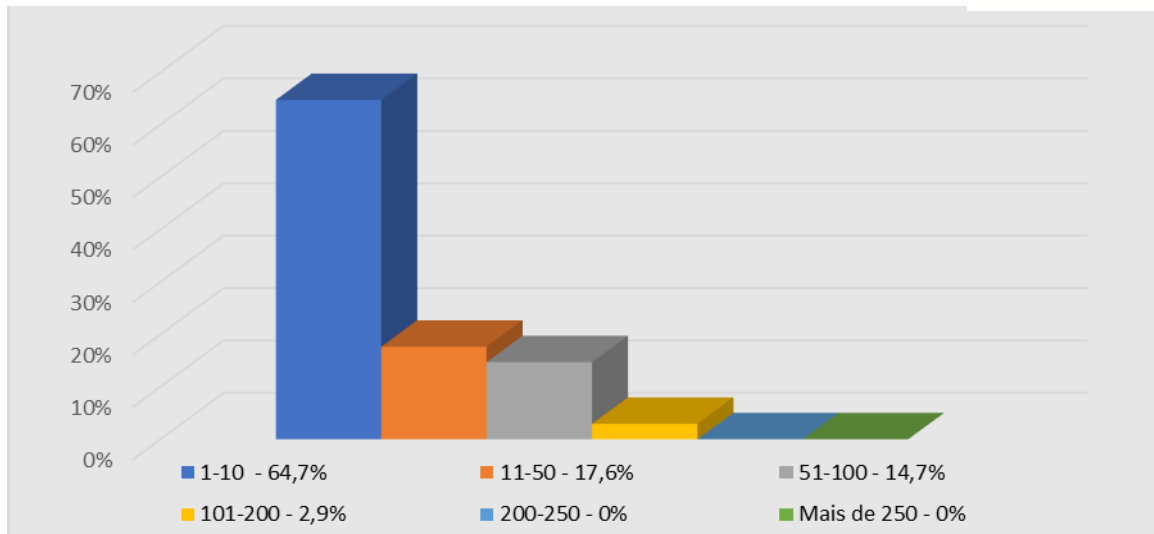
Only company's managerial level members (owner, manager, member of the management group, head of department or unit – one person per company) were invited to participate in the survey. To get reliable results, the research scope was limited to the following participation criteria:

- SMEs with at least 3 years work experience;
- More than 1 employee per company;
- At least EUR 10 000 annual turnover over the last budget year;
- No IT, technology or communication companies should participate in the survey.

In order to fully comprehend the results obtained within the survey, it is necessary to provide context in the current state of the regions businesses. As such, the first few pieces of insight are mostly for circumstantial awareness aiding to perceive the bigger picture.

As the results of the Digital Transformation Survey show, most of the surveyed businesses in the Tâmega e Sousa region have 1 to 10 employees.

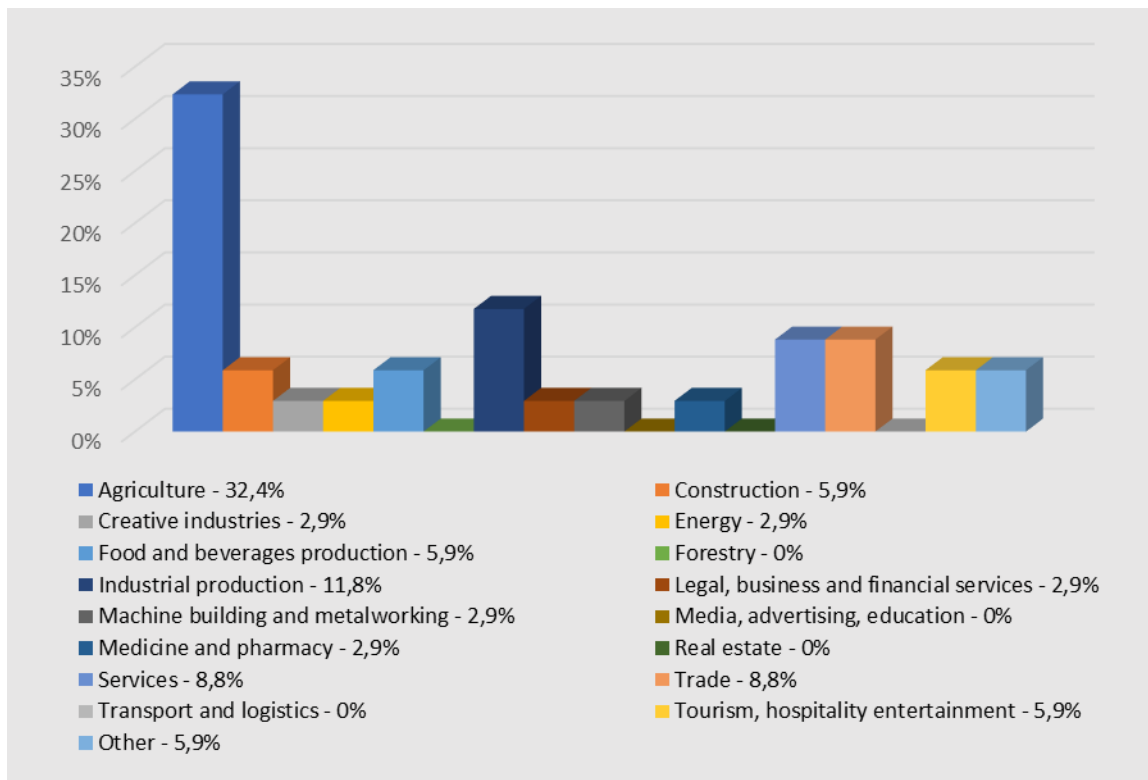
Figure 3 – Number of employees.



Source: DigiBest Survey 2020

These businesses operate on differently varied areas of activity, emphasis on agriculture, (mainly viticultural and oenological activities (wine producing), ~30%), followed by industrial production (~11%).

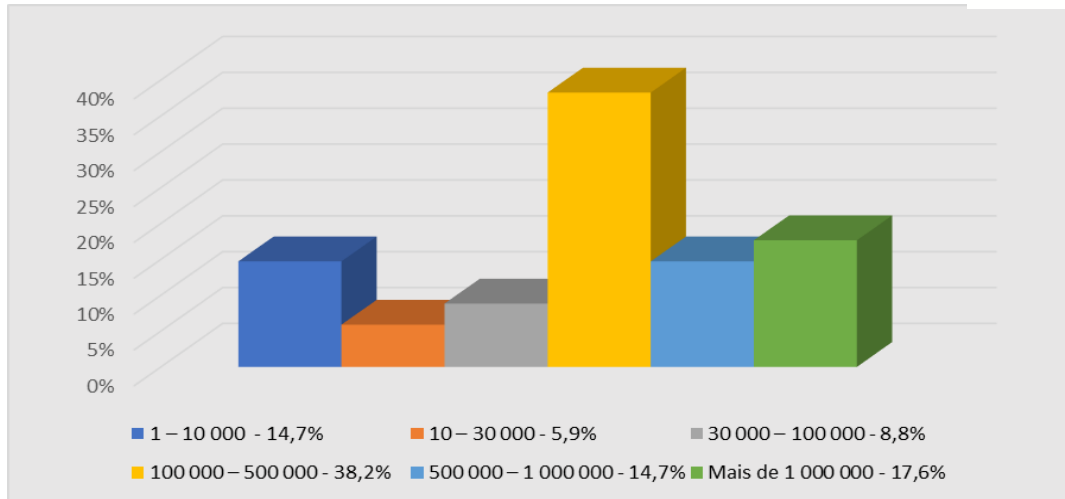
Figure 4 – Business sector.



Source: DigiBest Survey 2020

Most of the surveyed companies have a gross revenue between 100 000 to 500 000 (€), and the majority of businesses are concentrated on the latter part of the spectrum.

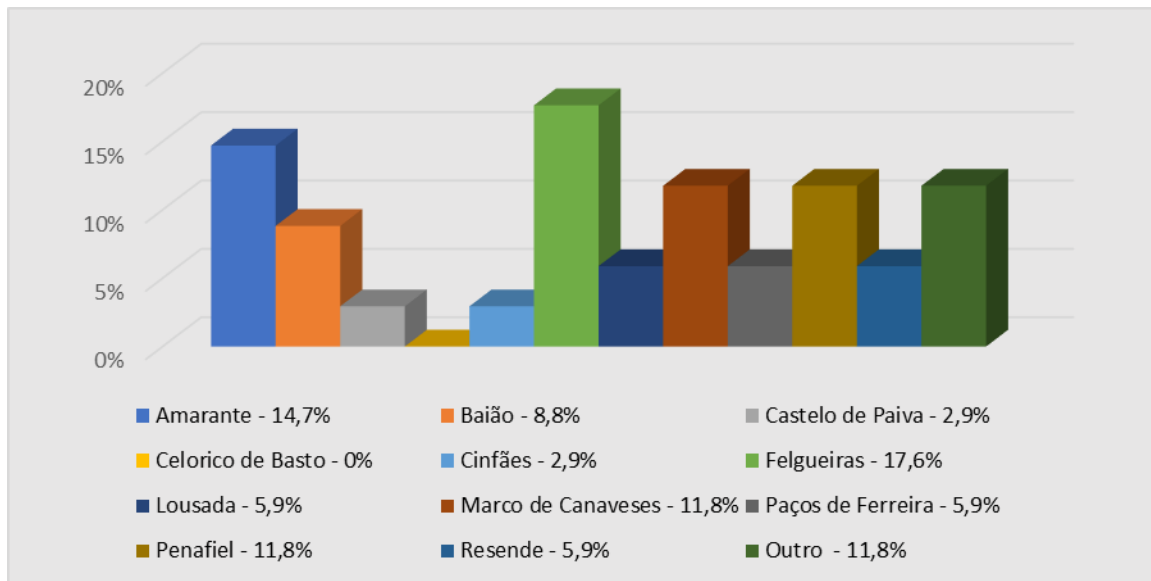
Figure 5 – Annual turnover.



Source: DigiBest Survey 2020

In the Tâmega e Sousa region, the business distribution across the region’s municipalities is as illustrated in Figure 6.

Figure 6 – Business distribution across municipalities.



Source: DigiBest Survey 2020

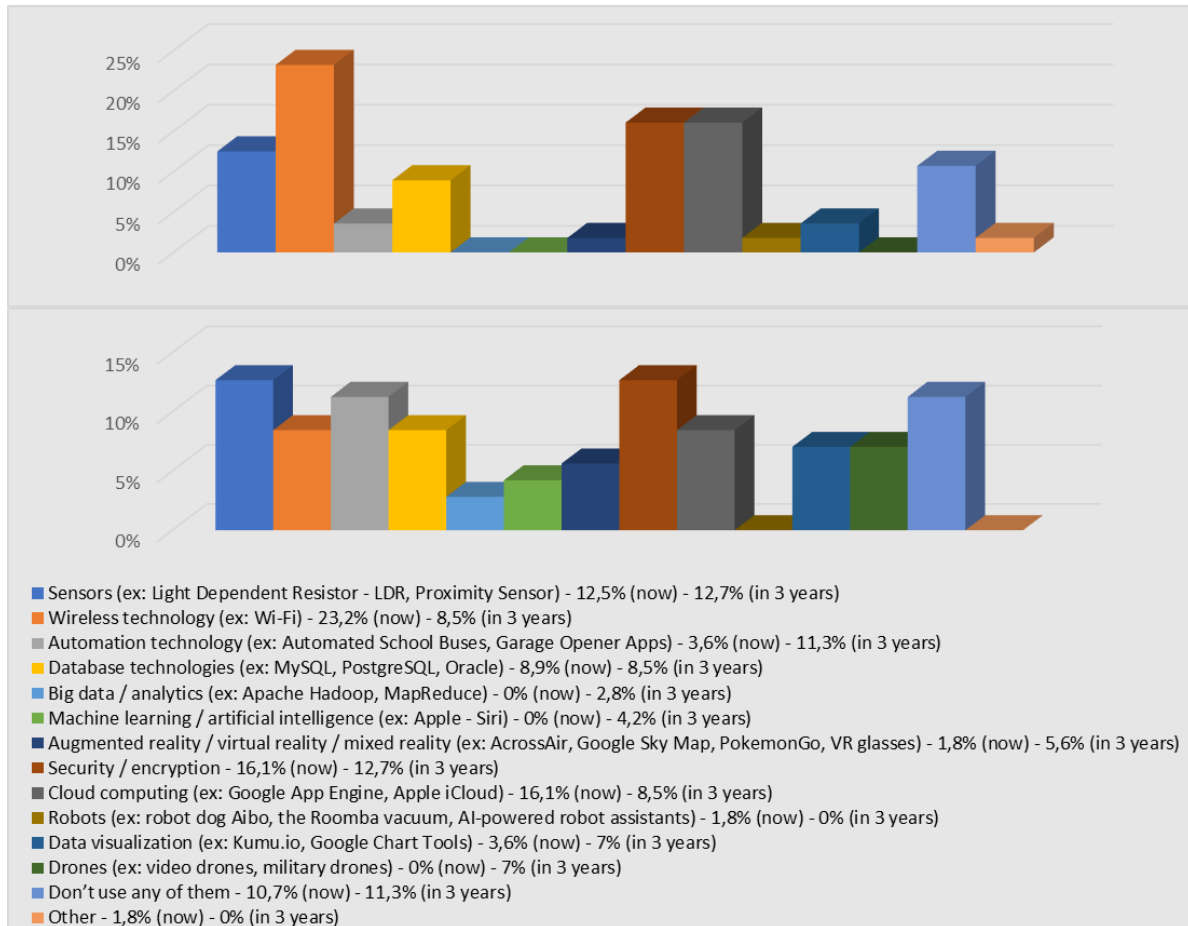
As a second starting point to the survey, entrepreneurs were asked if their companies would benefit from digital transition, they all said yes, most of them considering it would bring them greater business exposure, increase business profit and new customer acquisition.

Most companies possess high speed internet connection, 12% remaining with slow internet connections, but only about half of the surveyed are pleased with their present situation. Without a precise connection speed measurement and infrastructure information, it is unclear whether

some of these connections are indeed fast and reliable or even appropriate case.

On the recent introduction of digital technologies, answers varied greatly and it is evident the adoption of many commonly used practices (Sensors, Wi-Fi, Databases), as well as some advanced techniques (Cloud Computing), as can be seen on Figure 7.

Figure 7 – Recently introduced digital technologies and next 3-year plan.



Source: DigiBest Survey 2020

Confronting these answers with those of what digital technologies entrepreneurs plan to introduce in the next three years, given it also has a mixed set of responses, and considering the basics (Sensors, Wireless Technology, Databases, Cybersecurity) have not been widely implemented yet, it can be concluded that there is an absence of a clear roadmap to complete a smooth digital transition.

Similarly, the same disparity of replies occurs in the question of what IT solutions/services exist in the surveyed companies. A recognizable transversal baseline of key IT services should be easily identifiable, if this is not already done, this should be foreseen in the plan for 3 years.

The most popular reasons why companies have not introduced/implemente planning to do it in 3 years) are the high cost of implementation and a technologically unskilled workforce.

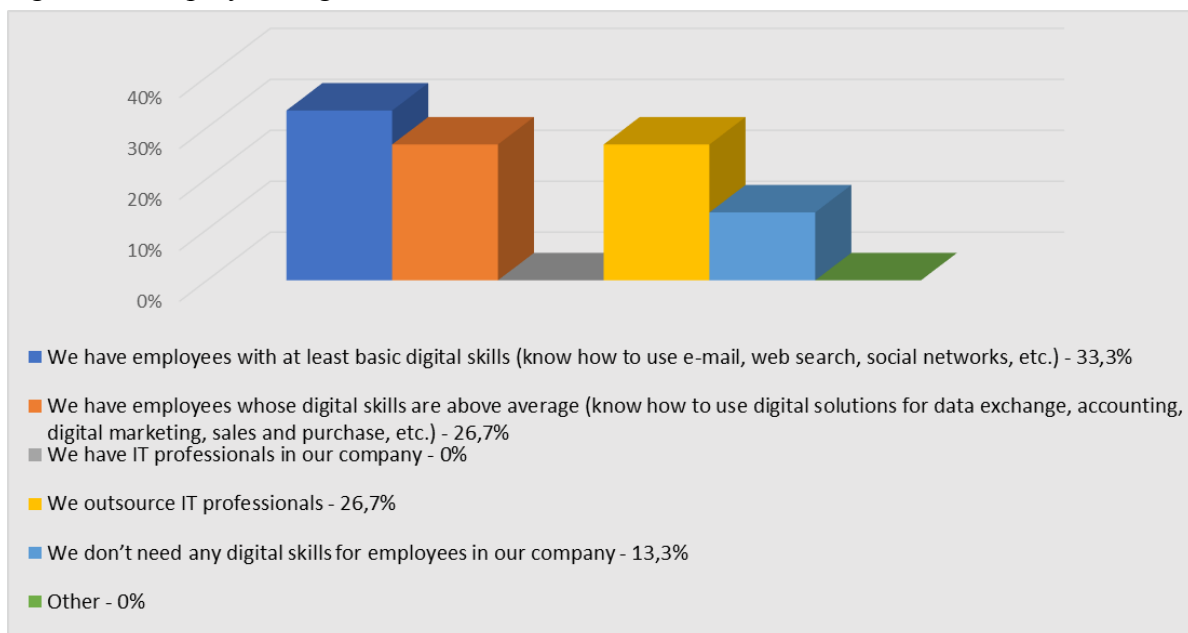
A majority of businesses uses online banking services (~87%), and half of those who don't, state that they don't need it. The same happens with public service portals and free public tools electronically available, most of the businesses (70%) use services like espaço-empresa and digital signature, but the ones who don't, say they never heard of them, aren't required by public entities or don't need them.

About three quarters of the region's businesses have used e-commerce services, to buy or sell online, or another feature associated with these services. The reasons of the companies that haven't used e-commerce are mainly related to logistics and lack of skilled workforce.

The use of communications and social media tools in today's world is very much widespread, this survey also reflects its usage by the vast majority of the businesses (~85%), being Facebook the most commonly used.

While performing digital transition, it is critical to be aware of the hazards it can bring, and in terms of digital security implementations, there is still a long way to go. Only half of the businesses admit to put into effect some sort of security measures, and far few of those who do (~7%), educate employees in cybersecurity. This is additionally concerning when, roughly 41% of all the surveyed companies don't have any digital transition plan. When asked if their employees were digitally literate, most businesses indicated that they had at least basic digital skills (Figure 8).

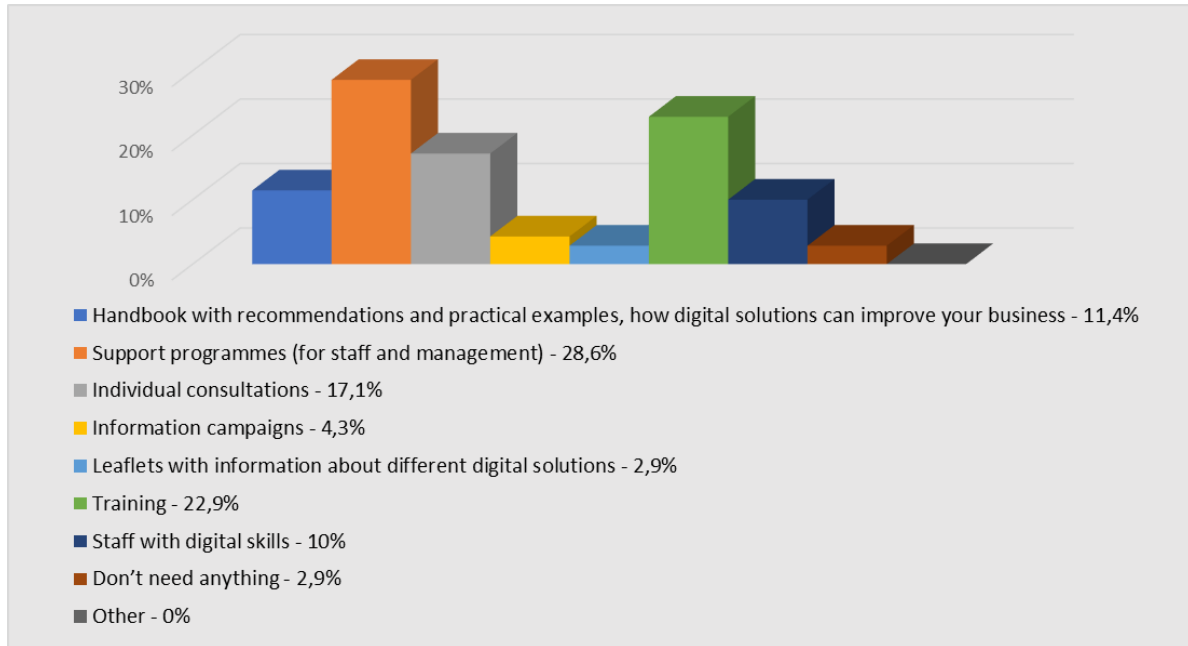
Figure 8 – Employees digital skills.



Source: DigiBest Survey 2020

When analyzing these numbers, it is fair to assume that employees acquire own expense. Despite this pressing situation, companies recognize there is ample room for improvement, mainly through support programs and professional training (Figure 9).

Figure 9 – Preferred digital transformation assistance.



Source: *DigiBest Survey 2020*

Analysing the survey results, it shows that most businesses don't have a digital implementation plan and lack the skilled workforce to enforce it. The results also show that there is no understanding why would digitalisation benefit them.

8. Conclusions and recommendations

In general, the “digital explosion” materialized in an unprecedented dynamic of technological innovation, providing resources for the application of digital technologies, it dramatically increases the business risks to which any analogue company is exposed, mainly by the entry of new, more agile and flexible competitors that capitalize on new digital tools. In a global survey conducted by EY in 2016, 90% of the 600 surveyed executives stated that their companies are facing greater competition from companies that have embraced digitalization, whether existing companies or new companies.

Portuguese SMEs have shown positive effects in relation to the change in business models and the way they operate, caused by digital technologies development. There are several successful examples of technological entrepreneurship in Portugal, particularly in Tâmega e Sousa, which made it in the global market due to their ability to disrupt the status quo of the sector in which they operate. As set out throughout this document we can see that most companies and their business management teams have great difficulty in envisioning the potential impact of the application of digital technologies to their business and, more than that, they fail to see the urgency of projecting and implementing it.

The results of the survey conducted in the Tâmega e Sousa region, show that most of the companies already use some sort of digital technologies/services (Figure 7). However, companies are not aware that they have already begun their digital transition and left it unfinished, or even feel that they don't need the transition at all. A minimum required services transversal to every area of activity should be defined, possibly by IAPMEI, to any companies seeking digitalization, otherwise the situation portrayed in the survey, where companies that don't possess essential digital technologies are already planning to implement non-essential technologies, is bound to be seen again.

On the particular case of the Tâmega e Sousa region, companies need to take into account the context in which they operate, identify the initiatives which best suit them, key skills/competencies, priorities and provide an implementation roadmap.

Given the survey findings, there is a clear lack of understanding on what digital transition is, probably that is why there is an apparent absence of a clearly delineated roadmap. Both entrepreneurs and employees need to be educated on what digitalization is, what benefits does it bring and especially what hazards can it cause.

Therefore, entrepreneurs have an obligation to themselves, their employees and the future of their companies, to urgently reflect on the impacts of digitalization on their business. Their medium and long-term investment plans must be aligned with emerging technological trends, as well as

contingency plans that protect the company from new upcoming threats. In the immediate course of action, companies should invest in updating their own workforce digital skills, and then, after completing this phase, companies can start to implement basic technologies/services.

On the policy side, contrary to what normally happens, companies and political power, must promote reflection and change within organizations through cost/benefit analysis. There is no doubt that the digitalization of the economy will have significant negative effects, such as the reduction of the number of jobs and the closure of companies unable to respond to the new technological challenges. However, the potential benefits, like increased productivity and competitiveness, the creation of new highly skilled jobs, greater efficiency in the use of natural resources, the improvement of people's living and working conditions, should largely outweigh the negative effects of this process. Given the current global pandemic, it is not an ideal place to start taking risks, but if there was a time of need for digital skills, this is it. A great deal of companies that begun their digital transition before this crisis, are very thankful that they did. It can be overwhelming to initiate a digital transition during these times, but the companies who can make the effort to do it, may find new business opportunities and break free from current restrictions. Evidently, in this type of action, every case is unique and needs to be analysed individually.

In spite of the awareness of innovation relevance, updating and upgrading is a necessary step for a stronger impetus to the digitalization of companies and the economy. There are external and unpredictable factors that limit the role of the economic actors regarding digitalization and, therefore, are seen as challenges for the future, making at times the most relevant asset the availability of talent.

Portugal and Europe have a shortage of qualified professionals with the skills to respond to the challenges of digitalization. Evidently because this burden cannot only weigh on the governments of the member states, although, as M. J. Couto et al. (2018)²⁷ concluded, it is important to define digital literacy national curricula, this burden must also fall on the companies. In addition to the central role that political power will play in reconfiguring the educational and academic model (ex.: simplex +), companies cannot neglect their formative and proactive role in hiring new qualified people (as shown on the survey results (Figure 8) and businesses lacking digital strategy).

Therefore, it is of the utmost importance that a deep strengthening between companies, business networks and related research and teaching networks occurs, making available the capitalization on these connections to attract talent and to keep themselves updated technology wise.

In fact, the focus of the digital transition, it is not an IT strategy or a one-shot investment, but the organizational transformation that requires time and continuous investments to be successful. A coherent and comprehensive digital strategy can be a catalyst for growth and innovation.

²⁷https://www.researchgate.net/publication/326712444_DIGITAL_LITERACY_IN_EUROPE_BEST_PRACTICES_IN_SIX_COUNTRIES

Business digitalization does not end indoors, society increasingly demands companies and legislators in order to enrich and accelerate the legislative process, making their speed compatible with the dizzying dynamics of innovation in the new digital world. Elon Musk said that one of the problems we face today is an interface problem, in which our human interface does not allow us to absorb/convey the amount of information that a computer is capable of providing/compute. Applying the same principle, if a company does not find a way to reinvent itself and update, it will easily be overwhelmed by new technologies, remaining obsolete until it becomes extinct.

In the coming decades, the advancement of the digital economy will have to follow the evolution of the most advanced countries, mainly through the capitalization of human education, the valorisation of market opportunities and legislative innovation. The dynamics demonstrated in recent years should be maintained in the future, with more and improved political and business strategies, whether individual or collective.

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