MONITORING PROGRESS IN NATIONAL INITIATIVES ON DIGITISING INDUSTRY

Country report

Malta

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Summary

Ranking 12th out of the EU 28 countries in the Digital Economy and Society Index (DESI), Malta belongs to the medium performing cluster of countries in terms of digitisation. Despite having improved on its overall performance and increased its score by 1.8 points, compared to 2017 Malta lost two positions in the DESI[1]. The main drivers of Malta's digitisation are the level of Connectivity and the Use of Internet Services by citizens. In terms of fixed broadband coverage, Malta remains a European leader, ranking 1st in 2017 as well as in 2018. Similarly, Malta is the top country for the provision of fast and ultrafast broadband coverage. Furthermore, Malta scores well above the EU average on most of the indicators on the usage of internet services. On the other side, key challenges that need to be addressed by the Maltese digital agenda are: the enhancement of digital skills – especially the low number of STEM graduates – and the availability of open data. Despite improving three out of four dimensions on the Human Capital indicator (DESI 2018), Malta still scores below the EU average, ranking 17th. Most importantly, the share of STEM graduates is one of the lowest in Europe (1.31%). In addition, and despite the strong use of technologies by individuals, Malta performs slightly below the EU average in the use of digital technologies by enterprises.

The Maltese economy has demonstrated a strong economic growth in recent years: +10.6% in 2015, +5.7% in 2016, +6.6% in 2017[2]. Although the European Commission forecast for Malta foresees a lower economic growth for 2019 and 2020, the annual GDP growth is still expected to be above the EU average. In addition, the employment rate has been constantly growing since 2010, when it was recorded at 60% of the working age population. It then reached 70% by 2015-2016, and it has nowadays settled at 73%. Nonetheless, in terms of gross added value (GVA), the manufacturing sector grew by 13% between 2016 and 2017, and by 8% by 2017 and 2018

In this context, the Maltese government in collaboration with national authorities developed different national strategies: the Digital Malta Strategy, the National eCommerce Strategy, Malta.AI, and the National eSkills Strategy 2019-2021. They constitute the macro-initiatives below which several sub-initiatives have been run. With regards to Pillar 1 of Digitising European Industry (DEI), Malta is a member of several cross-border cooperation programmes, including the Coordinated Plan on Artificial Intelligence, the Digital Skills and Jobs Coalition (DSJC), and the European Blockchain Partnership. In addition, the national government has developed a set of tools aimed at boosting the innovation capacity of enterprises (Pillar 2 and 3 of DEI): YouStartIT (funding programme) and Fusion R&I (R&I support) have been respectively funded with EUR 523,000 and EUR 2,910,556 in the years 2015-2018. Moreover, great effort has been put in the creation of a proper regulatory framework in relation to the rise of cryptocurrencies and to the entire blockchain technology (Pillar 4 of DEI). Indeed, in 2018, two important pieces of legislation have been launched: the Malta Digital Innovation Authority Act (MDIA Act) and the Innovative Technology Arrangement and Services Act (ITAS Act). Malta has also implemented measures to address the challenging performance of digital skills in the country (Pillar 5 of the DEI). The recent initiatives (FastTrak to e-Commerce, FastTrak to Mobile, Malta Cloud Forum, and eBiznify) have mostly focused on the empowerment of businesses and have been funded with EUR 136,000 in total, in the years 2017-2018. Overall, at least EUR 80 million have been invested across the initiatives of the different Pillars and the support mechanisms.

Table 1 presents an overview of the main initiatives identified, that will be further detailed in this report. Table 2 presents a short SWOT analysis of Malta on digitalisation.

Table 1: Overview of initiatives

Initiatives	Starting year	Overall strategy/DEI Pillar/support mechanism	Type of initiative	Sectors targeted	Digital technologies targeted	Size of companies targeted	Budget
Digital Malta Strategy	2014	Overall strategy	National ICT strategy	N/A	N/A	All	N/A
Malta.AI	2018	Overall strategy	National AI strategy	N/A	N/A	All	N/A
National eCommerce Strategy	2014	Overall strategy	National eCommerce Strategy	N/A	N/A	All	N/A
National eSkills Strategy 2019-2021	2019	Overall strategy	National Digital Skills strategy	Education, Labour Force, Citizen, ICT Professionals	Current and emerging technologies	All	N/A
YouStartIT	2017	Pillar 2	Mentoring, Funding	All sectors	Social Media, Mobile Services, Cloud, IoT, AI, DLT	Start-ups	National Public funding 2015: EUR 60,000 2016: EUR 66,000 2017: EUR 242,000 2018: EUR 155,000
Fusion R&I	2014	Pillars 2 and 3	R&I Support	ICT, Health, Resource Efficient Buildings, Manufacturing, Aquaculture, Tourism, Maritime services, Aviation and Aerospace	Social Media, Mobile Services, Cloud, IoT, Cyber Security, Robotics and Automation machinery, Big Data and Data analytics, 3D-printing, AI	Start-ups and SMEs	National Public funding 2015: EUR 790,132 2016: EUR 781,638 2017: EUR 959, 683 2018: EUR 379,103

Initiatives	Starting year	Overall strategy/DEI Pillar/support mechanism	Type of initiative	Sectors targeted	Digital technologies targeted	Size of companies targeted	Budget
Malta Digital Innovation Authority (MDIA) Act	2018	Pillar 4	Other regulatory measure	All sectors	Emerging technologies – initially Blockchain, DLTs, Smart Contracts	All	N/A
Innovative Technology Arrangements and Services (ITAS) Act	2018	Pillar 4	Other regulatory measure	All sectors	Emerging technologies – initially Blockchain, DLTs, Smart Contracts	All	N/A
MCA test and trial spectrum licensing scheme	2015	Pillar 4	Regulatory test beds	Telecommunications, ICT, Satellite, aeronautical, maritime	ICT	All	N/A
eSkills Malta Foundation	2014	Pillar 5	National authority	Government, Sectorial industry, ICT, Education	Current and emerging technologies	All	National Public funding
eBiznify	2018	Pillar 5	Training	ICT	N/A	All	National initiative, Public (30%) and Private funding 2018: EUR 96,877
E-Competence Framework	2018	Pillar 5	Training	ICT	N/A	N/A	National Public funding 2018: EUR 5,000
FastTrak to e-Commerce	2017	Pillar 5	Training	ICT	N/A	N/A	National Public (12.5%) and private funding 2017: EUR 6,000 2018: EUR 2,000

Initiatives	Starting year	Overall strategy/DEI Pillar/support mechanism	Type of initiative	Sectors targeted	Digital technologies targeted	Size of companies targeted	Budget
FastTrak to Mobile	2018	Pillar 5	Training	Wholesale and retail trade, public administration, professional services	N/A	N/A	National Public funding 2018: EUR 5,000
Malta Cloud Forum	2018	Pillar 5	Training	Wholesale and retail trade, public administration, professional services	N/A	N/A	National Public (26%) and private funding 2017: EUR 12,000 2018: EUR 14,000
Business Start	2014	Support mechanism	Funding	All sectors	Social Media, Mobile Services, Cloud, IoT, Cyber Security, Robotics and Automation machinery, Big Data and Data analytics, 3D-printing, AI	Start-ups	National Public (65%) and private funding 2015: EUR 75,000 2016: EUR 1,3 million 2017: EUR 575,000 2018: EUR 375,000
Microinvest	2015	Support mechanism	Tax relief	All sectors	Social Media, Mobile Services, Cloud, IoT, Cyber Security, Robotics and Automation machinery, Big Data and Data analytics, 3D-printing, AI	Micro-enterprises	National Public funding 2015: EUR 9,735,624 2016: EUR 12,518,776 2017: EUR 15,169,985 2018: EUR 25,160,467
Investment Aid	2014	Support mechanism	Tax credit	Manufacturing, Waste management, Water supply,	N/A	All	N/A

Initiatives	Starting year	Overall strategy/DEI Pillar/support mechanism	Type of initiative	Sectors targeted	Digital technologies targeted	Size of companies targeted	Budget
				Removal services, Warehousing, Postal and courier activities, Accommodation and food service activities, Information and communication, Financial activities, Professional and technical activities, Administrative support, Education, Human health and social work, Creative, arts and entertainment, Libraries, archives and museums, Sports activities, Other services.			

Initiatives	Starting year	Overall strategy/DEI Pillar/support mechanism	Type of initiative	Sectors targeted	Digital technologies targeted	Size of companies targeted	Budget
Skills Development	2018	Support mechanism	Tax credit/ grant	Agriculture, manufacturing, Waste management, Retail trade, Transportation and storage, Accommodation and food services, Information and communication, Professional and technical activities, Administrative support, Education, Human health and social work, Arts, entertainment and recreation, Other services	N/A	All	2018: EUR 10,000,000

Table 2: SWOT of Malta on digitalisation

Strengths: • Advanced regulatory framework • Working towards a forward-looking national strategy on AI • Strong forthcoming economic growth • Low unemployment rate • Dynamic services sector, with a strong ICT component • Existence of a dedicated digital strategy since 2014 • Attractive entrepreneurial environment and regulatory framework	**Weaknesses**: • Not enough progress in the increase of basic digital skills • Similar to the rest of Europe face shortages of ICT workers
Opportunities: • Upcoming national strategy on eSkills • Chance to become a role model for what concerns blockchain regulation • Legislation on vocational education	**Threats**: • Moderate progress of the Digital Strategy

1 General context

The objective of this report is to analyse the current status of national initiatives on digitising industry in Malta. The analysis has been conducted against the background of the Digitising European Industry (DEI), which was the first industry-focused initiative of the Digital Single Market launched by the European Commission in 2016.

Similar country reports will be produced for each of the 28 EU Member States. These national reports allow to:

- Monitor the development of national initiatives on digitising industry;
- Compare different national approaches; and
- Identify best practices of national initiatives.

Monitoring and reporting back on the development of the existing national initiatives is an important element of the DEI initiative, and this report should be seen as one part of it.

For more details about the DEI and our methodological approach for the country report, please consult the document attached.

1.1 Economic context and status on digitisation

General economic context

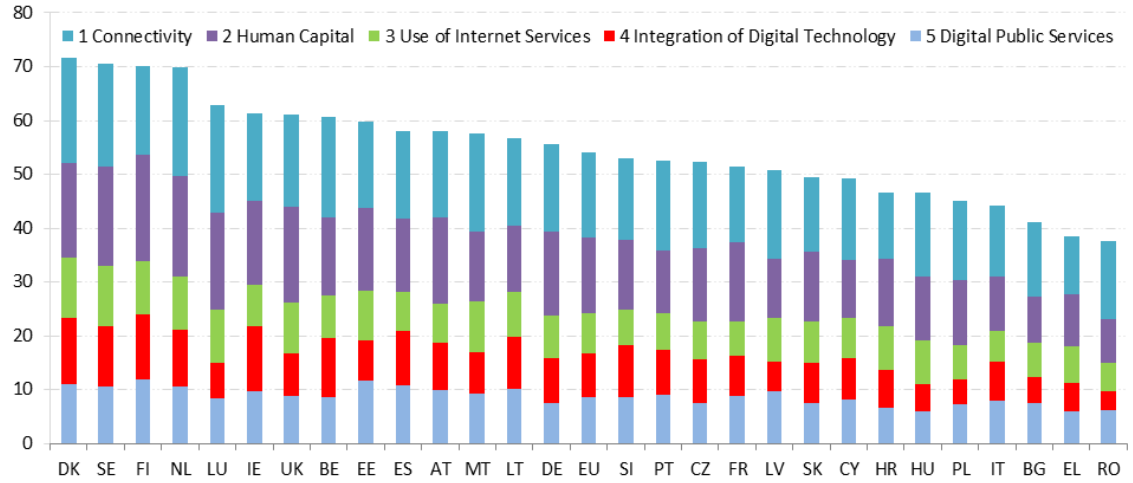
The Maltese economy has demonstrated a strong economic growth in recent years. The real GDP growth rate has increased at the following rates: +10.7% in 2015, +5.7% in 2016, +6.6% in 2017[3]. Although the European Commission forecast for Malta foresees a lower economic growth for 2019 (4.9%) and 2020 (4.4%), the annual GDP growth is still expected to be above the EU average[4]. The economy is services-oriented: according to the World Bank, in 2017 the valued added of the manufacturing sector was below 9% of GDP, while the service sector accounted for 75% of it[5]. Nonetheless, in terms of gross value added (GVA), the manufacturing sector grew by 13% between 2016 and 2017, and by 8% by 2017 and 2018. In addition, the output of services is following a growing trend since 2000.

The employment rate has been constantly growing since 2010, when it was recorded at 60% of the working age population. It then reached 70% by 2015-2016, and it has nowadays settled at 73%[6]. On the other hand, after reaching a peak of 6.9% during the recent economic crisis, the unemployment rate witnessed a significant reduction in the past few years, decreasing to a record-low 43.8%[7] in 2019. The labour market is expected to remain tight, with the unemployment rate projected to remain unchanged by 2021[8].

Status on digitisation

With an overall score of 57.7, and ranking 12th out of 28 EU Member States, Malta belongs to the medium performing cluster of countries – together with Spain, Austria, Malta, Lithuania, Germany, Slovenia, Portugal, Czech Republic, France and Latvia (DESI 2018).

Figure 1: Malta in the DESI ranking (2018)



Source: DESI 2018 Country report - Malta

The drivers of Malta's digital strategy are the level of Connectivity and the Use of Internet Services by citizens. The former is amongst the most efficient throughout European peers. Malta's 2018 coverage of Fixed Broadband, Fast Broadband and Ultrafast broadband goes up to 100% of the population, while Mobile Broadband take-up witnessed a significant growth: from 68 subscriptions per 100 people in 2017 to 93 in 2018. The latter indicates that Maltese internet users engage in a broad range of online services. Malta scores well above the EU average on this dimension of the DESI and performs above average on most of the indicators. 90% of internet users play music, videos and games (vs. 78% in the EU), 87% use social media (the highest in Europe, while the EU average is 65%) and 83% read news online (vs. 72% in the EU). Malta outperforms the EU also in video on demand subscriptions (26%) and in making video calls (56%).

Malta scores very well also in the provision of Digital Public Services. However, the picture of the index is still rather mixed as Malta is a leader in terms of availability of Pre-filled Forms, Online Service Completion and Digital Public Services for Businesses, but is still catching up in terms of eGovernment Users (48% vs. 58% in EU), availability of Open Data (37% vs. 73% in EU) and provision of eHealth Services (6% vs. 18% in EU).

Similarly to what was reported in 2017, the main barrier to digital improvement is related to the low number of individuals equipped with e-skills. Overall, along the indicator of Human Capital, Malta performs below the EU average, ranking 17th. Although the number of internet users, individuals with basic digital skills, and ICT specialists slightly improved in 2018's report, what keeps on hold the Maltese digital strategy is the low share of Science, Technology, Engineering and Mathematics graduates (STEM) – among the lowest in Europe.

The overall average performance of Malta is confirmed by the Digital Transformation Enablers' Index (DTEI)[9]. It provides a ranking for Member States based on the assumption that infrastructure, access to finance, and the demand and supply of skills are the most important factors driving digital transformation. According to the resulting index of enabling conditions for digital transformation, Malta ranks slightly above the EU average. Looking at the Digital Technology Integration Index (DTII) – that measures the digitisation of businesses and e-commerce – the situation is similar.

The table below summarises some of the economic and digital indicators for Malta.

Table 3: general economic and digital indicators for Malta

Country	% GDP from manufacturing	% GDP growth	DESI position – and change	DESI sub-indicators Human Capital, Use of Internet, Integration of Digital Technology in 2018
Malta	8.9% (2017)	6.7% (2017)	12th (2018) vs 10th (2017)	• Human Capital: 17th (17th in 2017) • Use of Internet Services: 6th (8th in 2017) • Integration of Digital Technology: 15th (13th in 2017)

1.2 National strategy on digitising industry

The table below offers an overview of the main measures characterising the Maltese national digital strategy.

Table 4: National strategy on digitising industry

Name	Digital Malta Strategy	National eCommerce Strategy	Malta.AI	National eSkills Strategy 2019-2021
Type	National ICT strategy	National eCommerce Strategy	National AI strategy	National Digital Skills strategy
Starting date	2014	2014	2018	2019
Objective	Implementation of the Digital economy's principles in order to lead Malta's development, create an ideal entrepreneurial climate and leveraging investment in technologies and human resources.	The strategy is aimed at ensuring that businesses have the necessary means and skills to capitalise on opportunities brought about by eCommerce. The strategy sets out Government's policy in relation to eCommerce and identifies a series of initiatives that are to be implemented during the strategy plan period.	The main objective is the development of a national strategy on AI in coordination with other strategies in Malta such as the one on DLTs and IoT.	Expanding and improving digital skills in Malta
Ministry/ministries in charge (website, contact person)	Parliamentary Secretariat for Financial services, Digital economy and Innovation within the Office of the Prime Minister	Parliamentary Secretariat for Financial services, Digital economy and Innovation within the Office of the Prime Minister and Malta Communications Authority (MCA)	Parliamentary Secretariat for Financial services, Digital economy and Innovation within the Office of the Prime Minister	Parliamentary Secretariat for Financial services, Digital economy and Innovation within the Office of the Prime Minister
Scope of the strategy/action plan	National and multi-sectorial, with focus on ICT	National with a focus on commerce	National and multi-sectorial, with focus on AI	National with a scope on basic and advanced digital skills and the IT professions
Measures included in the strategy/action plan	The strategy is built upon three vertical pillars (citizens, businesses, Government) and supported by a series of enabling/driving forces (regulation and legislation, infrastructure, human capital)	The strategy establishes four main pillars for Malta's eCommerce market up to 2020: 1) Engendering trust in eCommerce, 2) Transforming micro-enterprises, 3) Taking SMEs and industry to the next level, 4) Making Malta a global eCommerce player.	N/A	The National eSkills Strategy gives a strong strategic direction and trajectory, providing a set of recommendations with possible initiatives that Malta can undertake to adopt new technologies and develop local talents.
Overall funding and distribution by volume and source of funding (public/private, EU/national)	N/A	N/A	N/A	Public

Impacts, challenges and perceptions

The national strategies implemented by the Maltese government and the national authorities (e.g. MCA, eSkills Malta Foundation) are comprehensive and forward-looking, as they address many of the present and future challenges faced by society, businesses and public institutions. For instance, being aware of the need to equip its citizens with adequate skills, Malta not only has created an ad-hoc authority (i.e. eSkills Malta Foundation) but is ensuring that industry's needs are met by implementing a National eSkills Strategy as of 2019. It provides a set of key recommendations about the training needed by SMEs, the adoption of emerging technologies for economic growth, the creation of local talent. At the same time the strategy allows foreigners to see Malta as an ideal ICT career opportunity.

Furthermore, the national AI strategy aims at transforming the potential of Artificial Intelligence into a new contributor to Malta's economic growth in digital innovation. On this matter, Malta has established a taskforce made up of entrepreneurs, academics and experts in the field of automatization and computerisation. The taskforce "shall devise a holistic approach on the sector, involving academia, start-ups and companies, to find ways how to create a sustainable local engine for growth, look into the unknown risks of AI without hindering innovation and economic development, and create a new sector for investment on our shores"[10].

The guiding principle of the strategies is the improvement of the ICT sector, seen as the main driver of Malta's digitisation process. Information and Communication technologies are also in the focus of Malta's Smart Specialisation strategy that aims at boosting regional innovation, contributing to growth by enabling regions to focus on their strengths. Other specialisation priority areas are: services, human health and social work activities, construction, key enabling technologies.

1.3 EU cooperation in the field of digitising industry initiatives

In the field of digitising industry, Malta is a member of the following cross-border cooperation programmes: Coordinated Plan on Artificial Intelligence, Digital Skills and Jobs Coalition (DSJC), CEN Technical Committee (TC428), SCALE, European Centre for Women and Technology – ECWT, European Blockchain Partnership, and MED7 Collaboration. Furthermore, Malta participates in the ECSEL joint undertaking. The fields covered by the initiatives are diverse, ranging from Digital Skills for SMEs and workers, to blockchain, Distributed Ledger Technologies (DLTs), Smart contracts, and electronic components.

Given Malta's economy specific focus on ICT, the country is expecting the following benefits from the MED7 and the European Blockchain partnership:

1) the expansion of Malta's digital ecosystem including Research & Development and Innovation,
2) the development of the national economy and society and transition into truly digital ones thanks to DLTs,
3) DLTs can result in further democratisation of the European economic model,
4) Further enhancement of e-government services but also increased transparency and reduced administrative burdens, better customs collection and better access to public information;
5) DLTs can result in enhanced transparency, accountability and privacy for the end-users.

2 Other policy support to digitising industry

2.1 Boosting innovation capacity

The national strategy of Malta includes several sub-measures aimed at increasing the take-up of digital technologies among enterprises. Often these measures address only SMEs, as they constitute the backbone of the Maltese economy[11]. The table below presents the main initiatives to boost innovation capacity (Pillars 2 and 3 of the DEI).

Table 5: Boosting innovation capacity

Name	YouStartIT	Fusion R&I
Type	Mentoring, funding	R&I Support
Starting date	2015	2014
Objective	Incentivise digital entrepreneurship and support the national policy on emerging technologies	The ultimate goal of the programme is promoting and supporting local research and innovation as well as providing the necessary handholding in order to enable researchers and technologists to turn their innovative ideas into a market ready reality.
Relevant for Pillar 2[12] or Pillar 3[13] or both	Pillar 2	Pillars 2 and 3
Short description	4-month accelerator programme supporting and funding start-ups with a pre-seed grant of EUR 30,000 per start-up	FUSION is a national funding programme that supports Research and Innovation as well as provides the necessary support for researchers and technologists to turn their innovative ideas into a market-ready reality.
Granting organisation	Malta Information Technology Agency (MITA)	Malta Council for Science and Technology (MCST)
Participating organisations	PwC, Ganado Advocates, Vodafone, Go, Silicon Valletta	N/A
Sectors targeted	All sectors	All sectors
Technologies targeted	ICT technologies	ICT-based Innovation, Health (focus on e-health, active and healthy ageing), Resource-efficient buildings, High value-added manufacturing (focus on process and design), Aquaculture, Tourism product development, Maritime Services, Aviation and aerospace
Funding (split by private/public and national/EU), state period/annual funding	National Government Public funding 2015: EUR 60,000 2016: EUR 66,000 2017: EUR 242,000 2018: EUR 155,000	National Public funding 2015: EUR 790,132 2016: EUR 781,638 2017: EUR 959, 683 2018: EUR 379,103
Current status of initiatives	Ongoing	Ongoing

Impacts, challenges and perceptions

The innovation-boosting measures put in place by the national legislators in Malta are numerous and different in nature from one another.

YouStartIT is an accelerator programme targeting early stage tech start-ups and incentivising practices of digital entrepreneurship. If selected, applicants receive a EUR 30,000 pre-seed (consisting of a EUR 20,000 cash grant, and EUR 10,000 worth of direct support by a team of mentors) and 24/7 access to co-working space in SmartCity, in addition to tens of thousands of Euros worth of hands-on company formation, legal, tax and financial advice by the supporting partners (mentioned in the table above). Between 2015 and 2018, YouStartIT directly supported 25 projects which are currently active (hubs, competence centres, PPPs, etc.) and benefited seven businesses.

Another kind of initiative is represented by the **Fusion R&I programme**. It is a funding programme that supports Research and Innovation with the ultimate goal of promoting and supporting local research and innovation as well as providing the necessary support in order to enable researchers and technologists to turn their innovative ideas into a market ready reality. FUSION is composed of two main programmes, the Commercialisation Voucher Programme (CVP) and the Technology Development Programme (TDP). These two programmes are designed in a way to offer the necessary mentoring and financial support for researchers and technologists to take their ideas to the market. The CVP is aimed at improving the development and commercialisation potential of innovative research ideas whereas the TDP supports the actual development of innovative projects proposed by public entities and industry players. The programme overall benefited 15 enterprises until 2018.

In addition, the Maltese **Digital Hub** (MLSP) was conceived by Malta Enterprise to provide an international class facility for life sciences and information technology development. Regardless of a company's size or stage of development, the MLSP offers access to experienced and professional business and financial advice, as well as assistance for internationalization[14]. According to stakeholders' opinion, 98 businesses benefited from the activities carried on by the DIH.

Overall, the industry sector has a positive opinion of the measures implemented at national level to boost innovation. Enterprises are becoming more familiar with 4.0 technologies and seem willing to change their business models in order to take full advantage of the digital revolution.[15]

2.2 Regulatory framework for digital age

The table below presents the main initiatives related to a digital regulatory framework (Pillar 4 of the DEI).

Table 6: Regulatory framework for digital age

Name	Malta Digital Innovation Authority (MDIA) Act	Innovative Technology Arrangements and Services (ITAS) Act	MCA test and trial spectrum licensing scheme
Type	Other regulatory measures	Other regulatory measures	Regulatory test beds
Starting date	2018	2018	2015
Objective	The main objectives of the Act are: promoting and enforcing ethical and legitimate criteria in the design and use of innovative technology arrangements; harmonising practices and facilitating the adopting of standards on innovative technology arrangements in Malta in line with international norms, standards and rules; promoting transparency and auditability in the use of innovative technology arrangements; promoting ease of accessibility to the facilities provided by publicly available innovative technology arrangements and the recognition and implementations of the right of exit, withdrawal or termination of participation from any arrangement.	Same as for the MDIA Act	Creating a unique opportunity for enterprises to test and trial radio equipment or any type of wireless technology including 5G and IoT, on a nationwide basis with minimum investment.
Short description	The MDIA Act creates the Malta Digital Innovation Authority (the Authority) – a body whose purpose is to "address the development in Malta of all innovative technology arrangements and innovative technology services" (MDIA Act art. 6) in order to "seek the development of the innovative technology sector in Malta through proper recognition and regulation of relevant innovative technology arrangements and related services"	The ITAS Act outlines the different methods by which the Authority can recognize innovative technology arrangements and innovative technology services. The Authority can certify the qualities, features, attributes, behaviours, or aspects of a particular arrangement as fit for a particular purpose or purposes and then issue a certificate that "shall state the details of how the innovative technology arrangement is identified, including any public key or a brand name, and the Certificate shall be given a unique number for purposes of identification".	This Act establishes the framework for the grant of rights of use of radio frequencies and for the installation or use of radiocommunications apparatus.
Sectors targeted	All sectors	All sectors	Telecommunications, ICT, Satellite, aeronautical, maritime

Impacts, challenges and perceptions

The Maltese government not only has developed policies to boost innovation, it has also developed a proper regulatory framework in relation to the rise of cryptocurrencies and to the entire blockchain technology (enacting *de facto* the first blockchain regulatory framework in the world)[16]. In other words, the Maltese legislation is trying to be ahead of technology.

Although other countries have passed laws on cryptocurrencies and blockchains, Malta's regulation have been described as the most detailed and comprehensive[17]. Indeed, in 2018, two important pieces of legislation have been launched: the **Malta Digital Innovation Authority Act** (MDIA Act) and the **Innovative Technology Arrangement and Services Act** (ITAS Act). The former provides for the establishment of the Malta Digital Innovation Authority (MDIA) and outlines the Authority's mission to promote the development of the emerging technology sector in Malta. Among those, great visibility is given to DLTs technology. The latter establishes the definitional criteria and registration requirements for innovative technology arrangements ('ITA'), innovative technology services ('ITS'), and persons providing innovative technology services ('ITS providers'), all of which will be regulated by the MDIA[18]. The ultimate goals of the laws are threefold: to provide legal certainty for the first time in the industry; to support the growth of the increasingly important industry; to guide the government on how to embrace emerging technologies (initially DLTs including blockchain) and forge Malta into an industry hotspot.

Although the above-mentioned laws have only recently entered into force, stakeholders have expressed great appreciation towards the national legislators' initiative (5 on a 1-5 scale where 1 is low and 5 is high). The legal framework is nowadays regarded as one of the most advanced as it has embraced an emerging technology such as the blockchain technology. Furthermore, based on interviews, the plan of the Government is to keep introducing emerging technologies within the national regulatory framework.

Seeking to promote research and technological innovation in Malta, MCA has implemented the possibility of facilitating access to spectrum for technologies and services at developmental stage. The **Test and Trial Spectrum licensing scheme** is a legal framework operated by the authority in support of innovative spectrum uses which aims to exploit Malta's unique potential as a testbed. Companies that have granted licenses have the chance to carry out tests and trials of innovative wireless systems on a non-commercial basis[19].

2.3 Skills development

The table below presents an overview of the main measures implemented in Malta in order to address the challenging performance of digital skills in the country (Pillar 5 of the DEI).

Table 7: Overview of initiatives to develop digital skills

Name	eSkills Malta Foundation	eBiznify	Malta Cloud Forum	FastTrak to e-Commerce	FastTrak to Mobile	E-Competence Framework
Type	National Authority	Training	Training	Training	Training	Training
Starting date	2014	2018	2018	2017	2018	2018
Objective	The expansion and sustainable growth of the ICT skills in Malta, by the development of a broad set of skills from an early age, throughout their career and employment, which will ultimately boost employability, competitiveness and growth, in the Digital Economy.	Enhancing individuals' and businesses eCommerce skills	Increase cloud take-up among enterprises	The aim of the initiative was to help participants improve their businesses by establishing an effective online presence.	The aim is to encourage local business owners to take the next step in their eCommerce journey, by shedding light on the benefits brought about by mobile commerce.	Providing a common language to describe digital competences; Providing a classification scheme to collect and better understand the ICT labour market; Establishing a firm foundation for the maturing of the ICT profession; Assist the creation of more ICT professionals to meet the existing skills gap; Developing suitable learning programmes, including for the existing workforce; Ensuring the creation of a trustworthy ICT profession by delivering a Code of Ethics; Underpinning education, training and certification of ICT professionals;

Name	eSkills Malta Foundation	eBiznify	Malta Cloud Forum	FastTrak to e-Commerce	FastTrak to Mobile	E-Competence Framework
						Underpinning of trust in the ICT profession and professionals; Underpinning liaisons with other sectors regarding digital competences; Enabling comparability of different educational programmes;
Short description	eSkills Malta Foundation is an independent Government entity. It brings together representatives from the Malta Information Technology Agency, Ministry of Education, Malta Enterprise, Malta Gaming Authority, the Malta Communications Authority, and the Chamber of Commerce. eSkills Malta Foundation works as a consultancy for the government, with the aim of boosting ICT educational programs.	eCommerce Training programme open to both business-owners and individuals seeking to exploit digital commerce, empowering them to compete effectively in today's global marketplace	MCA established the "Malta Cloud Forum" to promote cloud computing in Malta to facilitate the development of an environment that is conducive to investment, innovation and continued social and economic growth	In 2017, the Malta Communications Authority, in collaboration with the Malta Employers' Association (MEA) and the General Retailers and Traders Union (GRTU), organised a number of hands-on information sessions on the use of digital marketing	Following the success of FastTrak to eCommerce the Malta Communications Authority (MCA) is now launching the second phase of this course by organising a number of information sessions on how to take your business on Mobile.	The Foundation was proposed by MCCAA (the national standards body) to represent Malta on the Technical Committee 428 which refers to standards for the IT profession and advanced digital skills.

Name	eSkills Malta Foundation	eBiznify	Malta Cloud Forum	FastTrak to e-Commerce	FastTrak to Mobile	E-Competence Framework
Granting organisation	The Foundation	Malta Communications Authority	Malta Communications Authority	Malta Communications Authority	Malta Communications Authority	Malta Competition and Consumer Affairs Authority (MCCAA)
Participating organisations	Malta Information Technology Agency, Malta Enterprise, Ministry for Education and Employment, Malta Gaming Authority, Malta Chamber of Commerce, Malta Communications Authority	GRTU and MEA	Stakeholders from the private sector	GRTU and MEA	GRTU and MEA	Representatives from other EU Countries, CEN, CEPIS, Local Mirror Committee comprising of the University of Malta, Malta College of Arts and Technology, Malta Information Technology Agency, Ministry of Education
Sectors targeted	N/A	ICT	Wholesale and retail trade, public administration, professional services	ICT	Wholesale and retail trade, public administration, professional services	ICT
Funding (split by private/public and national/EU), state period/annual funding	National Public funding 2014: EUR 150,000 2015: EUR 150,000 2016: EUR 150,000 2017: EUR 170,000 2018: EUR 170,000	National Public (30%) and private funding 2018: EUR 96,877	National Public (26%) and private funding 2017: EUR 12,000 2018: EUR 14,000	National Public (12.5%) and private funding 2017: EUR 6,000 2018: EUR 2,000	National Public funding 2018: EUR 5,000	National Public funding 2018: EUR 5,000
Current status of initiatives	Ongoing	Ongoing	N/A	N/A	N/A	Ongoing

Impacts, challenges and perceptions

In 2017, the Maltese Government and the eSkills Malta Foundation launched different studies, part of a broader strategy, aiming at assessing the current skills and education requirements within the ICT industry. The ICT Skills Audit 2017, which is an industry eSkills Demand and Supply Monitor, was then developed to better understand the evolution of advanced digital skills request in Malta and to develop a suitable policy response in order to boost individuals' employability. The increase and retention of women in ICT has also been given focus with a study and guidelines drafted by the eSkills Malta Foundation in 2018.

The studies represented a first but essential step to prepare adequate responses to the lack of digital skills and to the mismatch between education and the industry requirements in Malta.

Therefore, the **e-Competence Framework** is a European framework that provides a common language to describe the competences including skills and knowledge requirements of ICT professionals. It facilitates the matching of the ICT industry requirements with the competences of workers[20].

On the "businesses' empowerment" side, two main initiatives have been put in place. With the aim of boosting e-commerce (which in Malta is below the EU average according to the DESI report 2018), MCA is promoting two **fast-track training programmes** to increase the online presence of firms by presenting them the benefits brought by online tools.

In order to spread digital competences among enterprises, MCA is also running the **Malta Cloud Forum** (MCF), to increase cloud computing adoption amongst SME and enterprises. The MCF is a multi-stakeholder forum of parties interested in the cloud computing eco-system, comprising representatives from consulting companies, civil society, government and academia, who meet every quarter to discuss how the local uptake of the Cloud amongst businesses can be facilitated. The forum's ultimate ambition is to help increase and diffuse cloud awareness and create an innovative local culture that supports, embraces, and benefits from cloud computing. To this end, the forum sets out to organise various initiatives associated with cloud computing and also participates in a number of cloud, eCommerce, and general IT third-party events.

More recently, in October 2018, MCA started offering an eCommerce training programme, named **eBiznify**. According to the authority, it will help participants understand eCommerce, and provide guidance on the development of eCommerce-related services. eBiznify is open to both business-owners and individuals seeking to exploit digital commerce, empowering them to compete effectively in today's global marketplace. To be eligible to enrol for the course, participants need to have completed, at least, up to secondary level of education, possess basic knowledge of ICT and completed a basic course on digital marketing (e.g. FastTrak or similar) or have a minimum of one-year experience in a retail/business environment.

Due to the lack of outcome perception provided by the interviewees, it is no possible to estimate the impact of the above-mentioned measures on a 1-5 scale.

Recent developments

The Directorate for Digital Literacy and Transversal Skills (DDLTS), within the Ministry for Education and Employment, is in charge for the identification of gaps in educators' digital competence and supports them accordingly. Digital-literacy-support teachers, Heads of department and Education officers coordinate support for educators to make use of various technologies that are available in schools and include them in their lessons in order to engage the students and to facilitate learning. DDLTS supports also students to foster their critical and

confident use of technologies as well as their digital competence development. In so doing, DDLTS organises many initiatives to promote digital literacy, coding and computational thinking like family coding sessions and Code Week, internet safety, eTwinning, SELFIE and DigComp.

The Ministry for Education and Employment is investing in digital skills in compulsory education curricula and through an investment in ICT infrastructure in classrooms. In primary schools, digital skills have been strengthened through the One Tablet per Child (OTPC)[21] scheme where tablets were distributed to all students and educators in Year 4, 5 and 6 in all schools. The tablet is aimed to be an educational tool that helps students to go into deeper learning in literacy, digital literacy, numeracy, science and other areas. Students can learn anytime anywhere because the tablet facilitates collaboration, communication, creativity, character education, digital citizenship, critical thinking and computational thinking. The OTPC project aims to increase the skills and competences of students and future graduates; and to ensure that all children will be given a fair and equal opportunity to be closer to technology.

With regard to transforming teaching and learning of digital skills in a lifelong learning perspective, including the training of teachers, DDLTS is mainstreaming the EU's digital competence framework DIGCOMP focusing on digital literacies and 21st century skills. Professional Development is also provided to all the teachers involved in ICT C3 programme, Computing, VET IT and Applied IT. All these initiatives form part of the combined effort for the strategic implementation of the Digital Education Action Plan (EC, 2018).

2.4 Support mechanisms

The initiatives described in the previous sections are completed by generic financial support mechanisms that incentivise the level of digitisation among companies. All the mechanisms presented below are promoted by Malta Enterprise.

Business Start, Start-up Advance and **Microinvest** aim at assisting start-ups and small enterprises by providing them with a fiscal support. Business Start offers a seed funding (up to EUR 25,000) for enterprises at the early stage of their development which operate in the following NACE sectors: B, C, D, E, G, H, I, J, K, L, M, N, P, Q, R, S[22]. Particular attention is paid on projects carried out in the following areas: manufacturing, repair, overhaul or maintenance, industrial services, information technology, research and development, and innovation, eco-innovation, waste and environmental solutions, biotechnology, pharmaceuticals[23]. The Start-up Advance is another scheme that is offered to start-ups in the form of a grant. The grant has a maximum value of EUR 100,000.

Microinvest is an investment scheme aimed at encouraging small enterprises to invest in their businesses and to recruit new employees: beneficiaries will be rewarded with a tax credit equivalent to 45% of eligible expenditure. Microinvest is also the largest measure being implemented by Malta Enterprise, in terms of funding: ca EUR 63 million between 2015 and 2018.

Investment Aid and **Skills Development** are schemes targeting companies of different sizes. Investment Aid provides assistance in the form of tax credits to companies who are actually buying new machinery and equipment. This also includes new software that a company is seeking to purchase. The aid intensity under this scheme varies in accordance with the company size (small = 30%, medium = 20% and large = 10%). Skills Development was designed to enable companies to up-skill their workforce and as part of Malta's commitment towards lifelong learning. Thus, companies who are seeking to digitalise further or adopt new technologies can actually receive back in the form or tax credits and/or cash grants part (aid intensity related to company

size; Small = 70%, Medium = 60% and Large = 50%) of the costs that they would have incurred in relation to the training offered. Under this scheme all forms of training are covered.

3 Conclusions

The following table provides an overview on how the different digitisation initiatives implemented in Malta have been funded.

Table 8: Breakdown for the financing of initiatives

	Pillar 2	Pillar 3	Pillar 4	Pillar 5
	Digital Innovation for all	**Partnerships and industrial platforms**	**Regulatory framework for digital age**	**Preparing for digital future (skills)**
YouStartIT	2015: EUR 60,000 2016: EUR 66,000 2017: EUR 242,000 2018: EUR 155,000			
Fusion R&I	2015: EUR 790,132 2016: EUR 781,638 2017: EUR 959, 683 2018: EUR 379,103			
Malta Digital Innovation Authority (MDIA) Act			N/A	
Innovative Technology Arrangements and Services (ITAS) Act			N/A	
MCA test and trial spectrum licensing scheme			N/A	
E-Competence Framework				2017 EUR 3,000 2018: EUR 5,000
FastTrak to e-Commerce				2017: EUR 6,000 2018: EUR 2,000
FastTrak to Mobile				2018: EUR 5,000
Malta Cloud Forum				2017: EUR 12,000 2018: EUR 14,000
eBiznify				2018: EUR 96,877
eSkills Malta Foundation				2014 EUR 150,000 2015 EUR 150,000 2016 EUR 150,000 2017 EUR 170,000 2018 EUR 170,000
Business Start	2015: EUR 75,000 2016: EUR 1,3 million 2017: EUR 575,000 2018: EUR 375,000			
Microinvest	2015: EUR 9,735,624 2016: EUR 12,518,776 2017: EUR 15,169,985 2018: EUR 25,160,467			
Investment Aid	N/A			
Skills Development	2018: EUR 10,000,000			
Total spending	At least ca. EUR 80 million			

As confirmed by the DESI report 2018, Malta performance along the digitisation axis is overall positive. The country has achieved the target on broadband development of 100% coverage, thus giving access to its population and businesses to internet's connectivity and to the wide range of possibilities attached to it. On the other hand, Malta's main weaknesses are the level of digital skills, the availability of open data, and the use of digital technologies by enterprises.

In this context, different national strategies have been adopted in Malta by the national government starting in 2014: the Digital Malta Strategy, Malta.AI, the National eCommerce Strategy, and the National eSkills Strategy 2019-2021.

As part of the national strategies, there are several measures aiming at supporting companies in their digital transformation as well as adopting new technologies (Pillars 2 and 3 of the DEI). YouStratIT is an accelerator programme targeting micro-enterprises and incentivising practices of digital entrepreneurship, which supported 25 projects and directly benefited seven businesses. Fusion R&I programme, instead, is a funding programme that supports Research and Innovation with the ultimate goal of promoting and supporting local research and innovation as well as providing the necessary support in order to enable researchers and technologists to turn their innovative ideas into a market ready reality. The programme overall benefited 15 enterprises until 2018. Both programmes target mainly SMEs and/or start-ups, and their objective is to increase their competitiveness by enabling researchers to turn their ideas into market reality and by supporting financially the early stages of innovative firms.

Malta is also regarded as having one of the most advanced regulatory frameworks on cryptocurrencies and blockchains (Pillar 4 of the DEI). The 2018 MDIA and ITAS Acts regulate blockchain technology and cryptocurrencies in the country. Ultimate goals of the laws are threefold: to provide legal certainty for the first time in the blockchain/financial services industry; to support the growth of this increasingly important industry; to guide the government on how to embrace blockchain and cryptocurrency technology and forge Malta into an industry hotspot. The two initiatives are presented in the box below on good practices.

Regarding initiatives to prevent shortages of ICT specialists and boost digital skills (Pillar 5 of the DEI), the national Government, together with state agencies such as MCA, Malta Enterprise, and the primary role of the eSkills Malta Foundation, is in the process of implementing a comprehensive national strategy (National eSkills Strategy 2019-2021) with the aim of reducing the digital skills gap of the Maltese workforce. At present times, firms can already benefit from some measures aiming at improving their businesses and online presence (FastTrack to eCommerce and FastTrack to Mobile, eBiznify, and the Cloud Forum).

Box 1: Good practices

MDIA and ITAS Acts

The newly implemented legislation on blockchain technologies represent not just a best practice, but a *unicum* in Europe. The MDIA Act provides for the establishment of the Malta Digital Innovation Authority and outlines the Authority's mission to promote the development of the blockchain technology sector in Malta. The ITAS Act establishes the definitional criteria and registration requirements for innovative technology arrangements ('ITA'), innovative technology services ('ITS'), and persons providing innovative technology services ('ITS providers'), all of which will be regulated by the MDIA. The ultimate goals of the laws are threefold: to provide legal certainty for the first time in the industry; to support the growth of the increasingly important industry; to guide the government on how to embrace blockchain

technology and forge Malta into an industry hotspot. Although it is too early to assess the outcomes of the initiative, interviewees have expressed favour towards the acts.

To conclude, the table below provides a general overview of the main digitalisation initiatives implemented in Malta and the overall progress the country has realised so far with regard to digitalisation. Further, the table below illustrates the applications, usages and outcomes of the main Maltese initiatives all clustered by relevant pillar of the DEI.

Table 9: Total input-output overview

		Pillar 2	Pillar 3	Pillar 4	Pillar 5
		Digital Innovation for all	**Partnerships and industrial platforms**	**Regulatory framework for digital age**	**Preparing for digital future (skills)**
Application	Name of key initiatives (start dates in brackets)	YouStartIT (2017), Fusion R&I (2019) N/A		Malta Digital Innovation Authority (MDIA) Act (2018), Innovative Technology Arrangements and Services (ITAS) Act (2018) MCA test and trial spectrum licensing scheme (2015)	eSkills Malta Foundation (2014), E-Competence Framework (2018), FastTrack to e-Commerce (2017), FastTrack to Mobile (2018), Malta Cloud Forum (2018), eBiznify (2018)
	Funding (total amount and period)	EUR 3,4M between 2015 and 2018			EUR 931,000 between 2014 and 2018
	Industries addressed	All	N/A	Mainly blockchain technology and virtual assets	ICT, Wholesale and retail trade, public administration, professional services
	EU programme involved	N/A		N/A	N/A
Usage	Perception of initiative	Government support for digital transformation is rated high (4/5)		The regulatory framework is considered to be much better than before	N/A
	Take-up	1 DIH	N/A		N/A
Outcomes	Perception of outcomes	Perception of level of take-up of digital technologies is high (4/5)	N/A	The regulatory framework is considered fit for the digital age (4/5)	The required skills and labour resources are considered scarce (2/5)
	Outcome metrics	DESI overall rank: 12th (10th in 2017)		Evolution of CAPEX spending: EUR 139 million in 2015, EUR 148 million in 2016	Persons employed with specialist skills: 7,500 in 2015 and 9,400 in 2017. Share of enterprises providing training to develop ICT skills: 25% in 2015, 28% in 2017
	Change in outcomes	DESI Integration of Digital Technology Index: 15th in 2018, 13th in 2017			
End-goal	Productivity growth	As soon as measures have been launched, labour productivity has strongly increased (6.4% in 2015); however, it has recently slowed down (1.5% in 2016, 1.2% in 2017)			
Summary		Malta has recently launched a number of initiatives with focus on pillar 2, 4, and 5. Although more skilled workforce is still required to sustain growth in the ICT industry, Malta is nowadays a role model for what concerns blockchain regulation			

ANNEX 1 List of stakeholders interviewed

Type of stakeholder	Name of organisation
Government Representative	Policy Department, Programme Implementation and EU Affairs
Industry association	Malta Enterprise
University	University of Malta

ENDNOTES

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