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ABBREVIATIONS

BYOD	Bring Your Own Device
CHOGM	Commonwealth Heads of Government Meeting
CIO	Chief Information Officer
CSIRT	Computer Security and Incident Reporting Team
DAE	Digital Agenda for Europe
ENISA	European Union Agency for Network and Information Security
EU	European Union
FDI	Foreign Direct Investment
FITA	Foundation for IT Accessibility
FSWS	Foundation for Social Welfare Services
GCI	Global Competitiveness Index
GDP	Gross Domestic Product
ICT	Information and Communications Technology
IPv6	Internet Protocol version 6
IT	Information Technology
LGA	Lotteries and Gaming Authority
LSA	Learning Support Assistant
MBPS	MegaBits Per Second
MCA	Malta Communications Authority
MCST	Malta Council for Science and Technology
ME	Malta Enterprise
MITA	Malta Information Technology Agency
NGA	Next Generation Access
NSO	National Statistics Office
PC	Personal Computer
QoS	Quality of Service
R&D	Research and Technological Development
R&I	Research and Innovation
SME	Small and Medium Enterprise
STEM	Science, Technology, Engineering and Mathematics



Foreword by
JOSEPH MUSCAT
Prime Minister

The advance of technology is exciting with so many opportunities. We as a country need to embrace technology, set a path and ensure we use it well. The Digital Malta Strategy is that path.

It is important that all our people are involved in the advance of the Maltese economy. Nobody should be left behind. This Strategy not only results from a wide consultation but also from an underlying deep concern to involve everyone. In its pages are actions and commitments to turn us into a digital society.

Information and Communications Technology is an important industry in itself, while just about every other industry depends on ICT to thrive. This strategy will encourage innovation and entrepreneurial ventures and will help all businesses remain competitive and fight their corner in the global economy.

There is also a clear message here that Malta is a good place to set up business. We not only offer the European open market, and good links with Africa and the Middle East, but we are well positioned on the digital superhighway. We are accelerating in the fast lane of technology and don't intend to take our foot off the pedal.

The road ahead is a lot clearer because of the Digital Malta Strategy. I encourage you to be part of it.

A handwritten signature of Joseph Muscat in dark blue ink. The signature is written in a cursive style and is underlined.



Foreword by
EDWARD ZAMMIT LEWIS
Parliamentary Secretary

We live in a competitive world. We can buy products from around the corner or thousands of miles away. And what we make we can sell in the local shop or to a market of millions. This is the global economy.

Barriers have come tumbling down. We can be continents apart yet communicate in an instant. The world is more inter-connected and that is the way it will stay.

In both government and business there has been recognition of the need to understand new technology and utilise it. But could we be doing more? The answer is yes. We would be foolish to allow ourselves to lag behind our competitors.

The Digital Malta Strategy sets out how everyone can learn, broaden their skills and make good use of technology. It sets out what we should be doing for the next few years, but it is also flexible in that it recognises how fast technology changes and puts us on alert for future developments. The young are born into modern technology and have never known a world without gaming, mobiles and the Internet. Grandparents may not be so enthusiastic with gadgetry yet they still delight in video chats with their grandchildren on the other side of the world. And everybody else is constantly living in an online world of email, social media and the web. Government has increasingly put its services online and there can be few businesses not powered by technology.

Technology matters to us all, and that is why the Digital Malta Strategy is so important. It is the way forward for all Maltese.

A handwritten signature in blue ink, consisting of several fluid, overlapping strokes that form a stylized representation of the name.



INTRODUCTION

ICT can empower the economy and society, directly and indirectly. It is both critical infrastructure and an enabling tool. Malta recognises this and government is setting out a vision to transform the country into one which will prosper as a digitally-enabled nation in all sectors of society.

This will be done through the implementation of this strategy, which is being branded as Digital Malta.

¹ The term 'digital' within this text refers to the application of information and communication technology



The Strategy outlines three strategic themes - **Digital Citizen**, **Digital Business** and **Digital Government**, and these are supported by three strategic enablers: Regulation and Legislation, Infrastructure and Human Capital.

The Strategy puts forward a suite of guiding principles and actions for ICT to be used for socio-economic development. It sets out how ICT can make a difference in areas such as the economy, employment, industry and small businesses, and how it can be used for national development, to empower citizens and transform government. It encourages everyone to reap the benefits that ICT can bring: better education, stronger businesses, efficient Government, sustainable economic growth and much more. Truly, it can provide a better quality of life for the Maltese. It is essential that the benefits of this nation's knowledge society are enjoyed by every citizen irrespective of age, gender, sexual orientation, disability, education, economic means or race. This will be achieved through intervention to circumvent obstacles. There will be action to enhance digital literacy and social equality, increase access for all and stimulate local content.

The ICT industry in Malta has achieved substantial growth in the past decade. Excluding the iGaming sector, it now accounts for more than 5% of the nation's GDP. Besides being a sector in its own right, ICT also helps other business sectors to develop and grow. It is the enabler of the smart specialisation areas identified in the National Research and Innovation Strategy 2020. The Digital Malta Strategy has been designed to foster a strong, competitive, ICT-enabled and export-oriented industry, able to compete globally. It will also propel ICT further in sustaining business and innovation, contributing to economic growth.

Innovative application of ICT is also a crucial catalyst in the transformation of government. Sophisticated ICT implementations carry little value if citizens and businesses are not able to use public services or participate in the policy making process in meaningful ways. This strategy advocates the re-engineering of public services to achieve greater responsiveness to citizen and business needs, using multiple channels. Government will have an open approach to communicating and sharing information following the principles of transparency, participation and collaboration.

Technology is continually advancing so this strategic plan will not, in the conventional jargon of management, be limited only to rational policy interventions. The Digital Malta Strategy is pragmatic, and flexible enough to react to future developments. There is high-level strategic direction that allows entities flexibility in implementation.

Digital Malta is not just a Strategy to provide national policy direction on ICT initiatives covering 2014-2020. It also constitutes a framework, permitting policy makers, business leaders and entrepreneurs to take decisions now knowing they will be supported by policy that is responsive to the technological advances of the coming years.

The Digital Malta vision is ambitious. The path towards achieving it will no doubt need refinement and, sometimes major updating, because today's assumptions will carry diminished significance as events unravel and competitive advantages shift. These refinements will be reflected in the Programme of Initiatives complementing the Digital Malta Strategy. Each year a recalibration of the Initiatives will take place after measuring outcomes and targets achieved.

This document is the result of an extensive consultative process. The first phase covered a series of consultation workshops with ICT stakeholders from the public and private sectors, associations and other interest groups from civil society, as well as the public at large. The second phase included more focused discussions with stakeholders involved in the eventual implementation and ownership of parts of the Strategy. This consultative approach will continue during the life-time of the Strategy.

Digital Malta reflects the collective aspirations and goodwill of stakeholders, structured in the form of a national plan owned by the stakeholders themselves. It is a journey that all stakeholders will nurture to attain a vision of where Malta wants to be.

2

THE LOCAL ICT LANDSCAPE: CHALLENGES AND OPPORTUNITIES

Malta has shown remarkable resilience in the face of the sovereign debt crisis that affected many other countries in Europe ². Nevertheless, the crisis cannot be ignored because of the exposure that comes from having a small, open economy. Indeed, in May 2013, the European Commission recommended that Malta be placed under an Excessive Deficit Procedure and called for reforms in pensions, healthcare and sustainable public finances. According to Eurostat, the unemployment rate in Malta ranks among the lowest in the EU and, in 2013, the inflation rate fell to 1.38% compared to 2.72% and 2.42% in 2011 and 2012 respectively. The rate of economic growth for 2013 was higher than expected ³ and a growth of 1.7% is projected for 2014 ⁴.

² Most affected countries were southern European countries, Ireland and Slovenia.

³ Source: Statement published by Standard & Poor's on 17th January 2014.

⁴ Source: 2014 Budget Speech as presented on 4th November 2013.





In the GCI for 2013-2014, Malta has climbed six places and now ranks number 41, out of 148 countries ⁵. Switzerland, Singapore and Finland are ranked in the top three positions. Compared to other European countries, Malta is placed 17th ⁶. Among southern European countries, France and Spain performed better than Malta, while Italy, Turkey, Portugal and Cyprus performed worse. The results are encouraging, but there is no room for complacency and Malta should actively strive to improve its competitiveness. A strong digital economy is central to any country's competitiveness, growth and jobs strategy. Our technological readiness is vital in this regard, with Malta ranking 16th in the Technology Readiness index (Fig. 1).

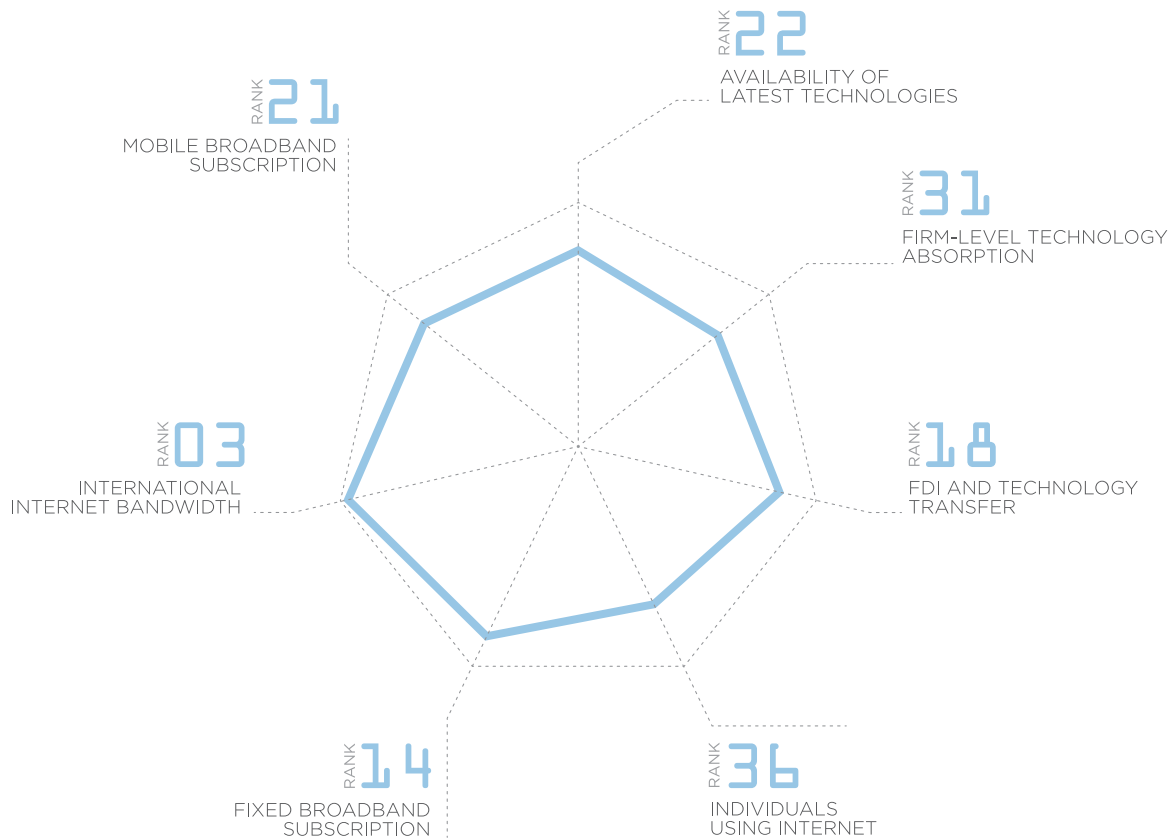
Fig. 1

TECHNOLOGICAL READINESS INDEX

MALTA **RANKS 16**

OUT OF 148 COUNTRIES.

(Source: World Economic Forum)



⁵ Source: The Global Competitiveness Report (2013 - 2014) - <http://reports.weforum.org/the-global-competitiveness-report-2013-2014/>.

⁶ This ranking takes into consideration European countries that are not members of the EU, such as Switzerland and Norway.

Universally, ICT is acknowledged as a fundamental enabler and one of the pillars for socio-economic development. The past ten years have seen a rapid growth of the ICT industry in Malta. ICT contributes circa 5.7% value-added to national GDP ⁷ (Fig. 2) and employs 3.3% of a population of 165,300 gainfully employed ⁸ (Fig. 3).

In 2013, the World Economic Forum ranked Malta in 28th place (out of 138 countries) in its Networked Readiness Index (Fig. 4), which measures the preparedness of an economy to use ICT to boost competitiveness and well being. Malta also featured in fourth place for the importance of ICT to the government vision and in fifth place for successfully promoting the use of ICT within the country ⁹. The fact that there is political consensus on ICT strategic direction is a strength.

Fig. 2
GROSS VALUE
ADDED OF LOCAL
ICT INDUSTRY

Source: NSO

ICT AS PERCENTAGE OF GDP

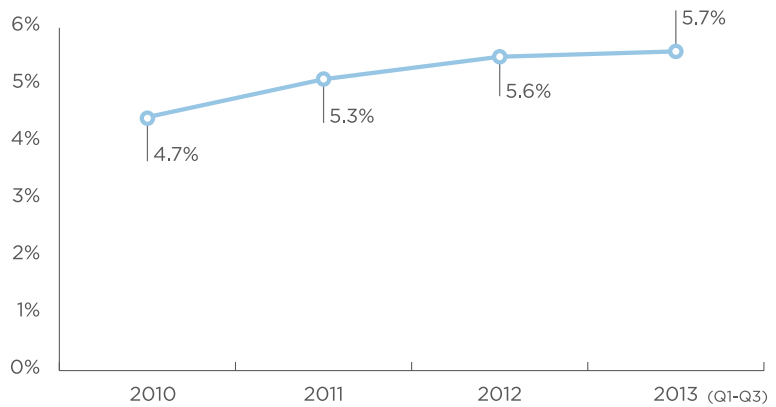
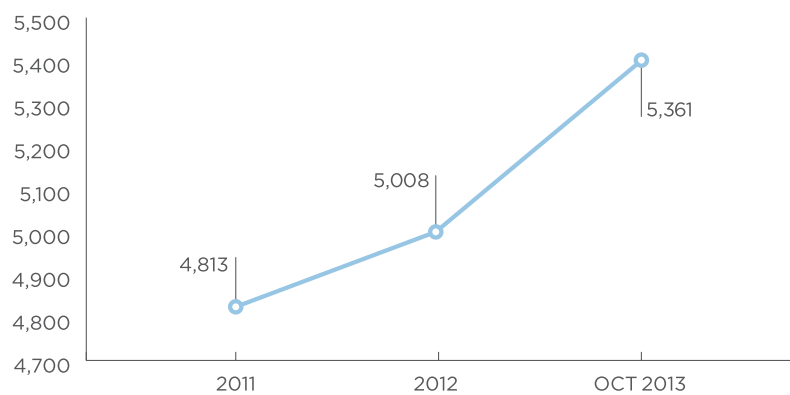


Fig. 3
EMPLOYMENT
WITHIN
ICT INDUSTRY

Source: NSO

ICT FULL-TIME EMPLOYMENT



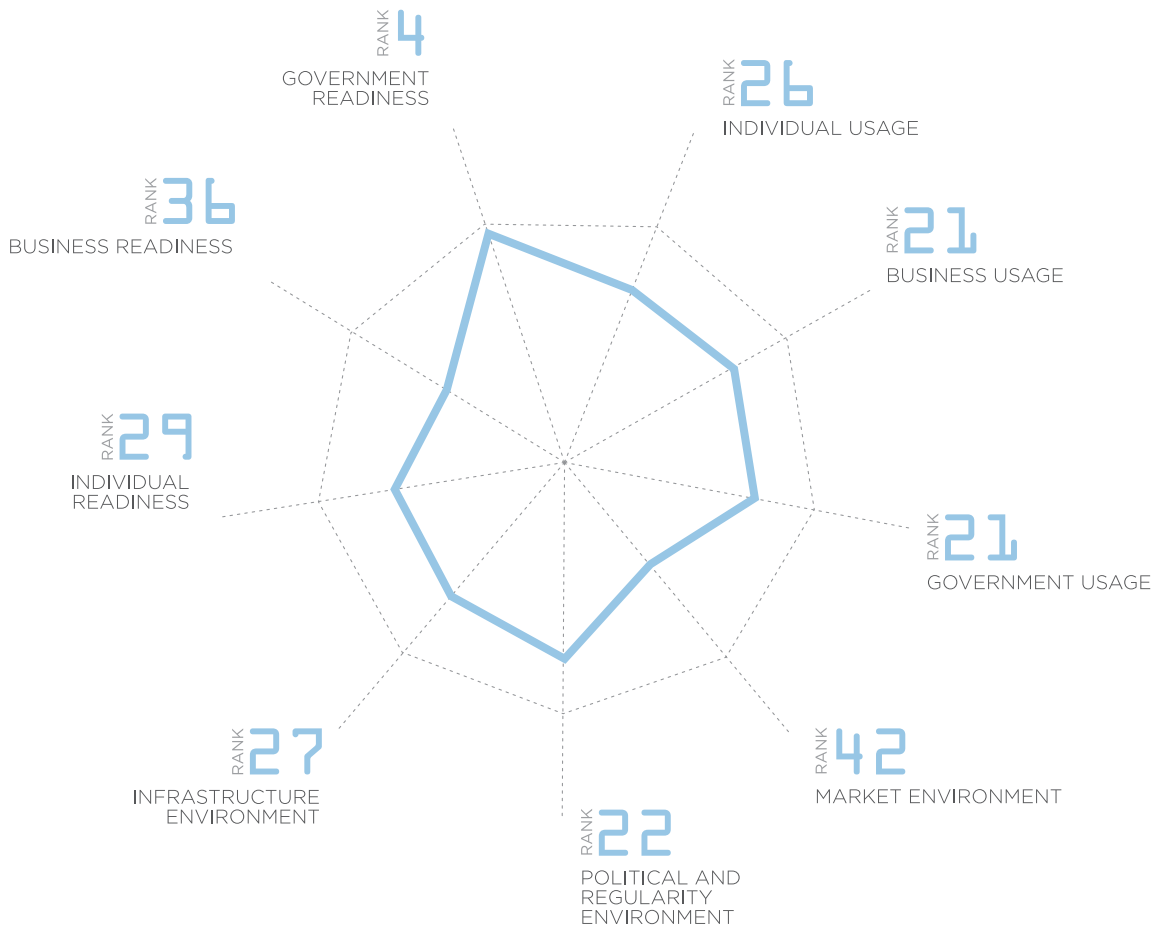
⁷ Source: NSO - Gross Domestic Product. The ICT sector excludes iGaming, which is classified under a different category.

⁸ Source: NSO - Gainfully Occupied Population.

⁹ Source: The Global Information Technology Report 2013 prepared by the World Economic Forum.

Fig. 4

NETWORKED READINESS INDEX
MALTA **RANKS 28** OUT OF 138 COUNTRIES.
(Source: World Economic Forum)



TAKE-UP OF ICT

Improving ICT access and its use is an important challenge. Although the ICT footprint is increasing, not all homes, schools, or businesses have taken it up or are using it as they could.

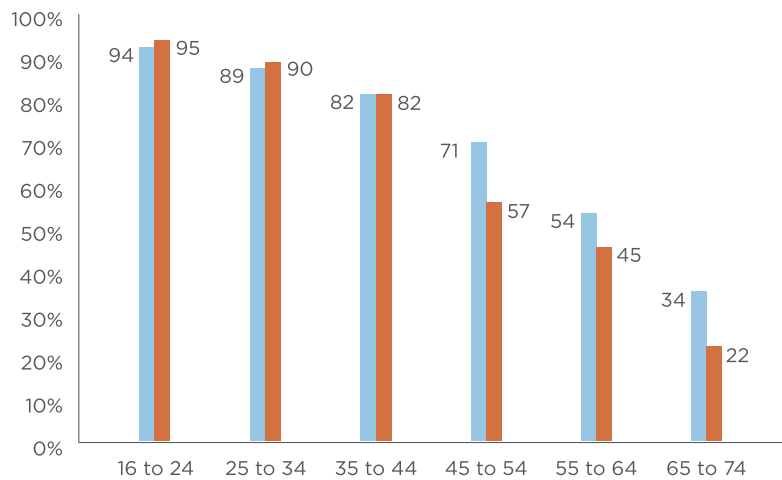
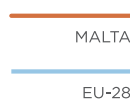
Compared to other EU countries, Malta falls behind in the numbers using the Internet, uploading self-created content, using Internet banking, taking online courses, and looking for a job or sending a job application.

SMEs and start-up companies need encouragement to see ICT more as a tool for reducing costs, innovating and gaining access to wider markets. Citizens are expecting ICT to play a more significant role in the next generation of healthcare services; it shall enable patient empowerment, and safer and more personalised care.

Fig. 5

PERCENTAGE OF INDIVIDUALS USING THE INTERNET AT LEAST ONCE A WEEK BY AGE IN 2013

Source: Eurostat



People with age-related dependencies or different abilities need to be empowered to stay active, live independently and avoid institutionalisation. All citizens, including those at risk of exclusion (for example, those with different abilities, low digital literacy/eSkills), need access to smart environments and innovative services.

Over the past decade ICT has become integrated in schools, with all pupils having access to computers and the Internet. Yet, building capacity in education remains a challenge. It is important that teachers have the skills to harness eLearning materials. Teaching methods need updating and there must be sufficient digital content for students to gain full advantage of the benefits of ICT.

Greater effort is needed to encourage learning among unskilled working-age adults, the elderly and people with disabilities. Those without eSkills risk not reaping benefits from ICT, both in terms of earnings and job prospects. ICT offers great potential to bring the unemployed back into the workforce.

HUMAN CAPITAL

The industry, both the ICT-producing and the ICT-using sectors, are supported by experienced, efficient, skilled and multi-lingual professionals. In 2012, Eurostat reported that Malta ranked in 23rd position out of the EU27+ in terms of computer skills. Between the 2007 and 2012, the average number of ICT-related graduates from the University of Malta was 151. The highest number of ICT graduates from the University of Malta was registered in 2011 with 197 – a share of 6.8% of all graduates. During the same period, the average number of

graduates from the ICT Institute within MCAST, which is the country's leading vocational education and training institution, in levels 5 & 6 was 542 graduates.

Work practices are flexible and unit labour costs are generally competitive and responsive to market conditions. These attributes are complemented by a competitive tax regime.

Within the ICT labour market, the low female participation rate, the misalignment between the ICT education curriculum and industry needs (such as the lack of specialised skills for the iGaming sector) and the lack of supportive education are serious weaknesses. These are hampering resource capacity, resource readiness and innovation.

The arrival of 'cheaper' skilled competitors, particularly from the Baltic region, Eastern Europe and Asia, poses a new threat to the digital industry in Malta.

THE CHALLENGES FOR THE LOCAL ICT INDUSTRY

Similar to other industries, it is clear that the ICT industry in Malta is past the stage where it can attempt to achieve higher levels of economic activity on the basis of low labour costs. Incentive packages are no longer sufficient in attracting investment, because today there are equally attractive incentives in other countries. Investors seek profitable opportunities in countries offering the best prospects in terms of competitiveness. If Malta is to improve its performance in attracting FDI, greater focus on knowledge and innovation-based investment and on economic efficiency¹⁰ is needed. These factors carry the promise of sustained growth in the wealth-generating capacity of the Digital Economy.

SMEs within the ICT industry know that their main weakness in terms of growth is the small size of the local market. Some of these businesses are adopting a more outward-looking entrepreneurial culture that is focused on exports rather than relying on short-term advantages in the captive domestic market. However, these SMEs face a multitude of difficulties. The World Economic Forum has identified a list of problematic factors for doing business in Malta. The top three are inefficient government bureaucracy, limited access to financing and insufficient capacity to innovate. Malta also lacks the adequate schemes for business angel investors¹¹, who are generally needed by start-ups to take off, and by established ICT businesses to expand. This may reflect Malta's entrepreneurial culture, which tends towards lower risk or conventional "bricks-and-mortar" ventures.

Currently, most local ICT companies are software services and hybrid solution providers and integrators. Few qualify as software products companies, deriving well over half of their sales from licence fees. This may suggest that less intellectual property, inherent in the software being developed, can be translated into patents or copyrights. Similarly, the lack of participation and contribution

in open source communities limits the exposure of Maltese skills and the potential to increase FDI. The small size of the Maltese islands presents special opportunities for the ICT industry. These include the deployment of "first-in-the-world" nation-wide projects or "test bed" projects in strategic alliances with ICT multinational companies. Highlighting these opportunities is important in FDI strategy, especially when it comes to targeting ICT investment and building partnerships. With important events due to take place, with 'including the hosting of the CHOGM in 2015, Malta's EU Presidency during the first half of 2017 and Valletta as the European Capital of Culture in 2018, now is the time to launch a branding exercise.

TRUE VALUE TO CITIZENS

For the past twenty years, government has substantially invested in ICT. Government capitalised on the lack of complexity in Malta compared to large countries, which often have two or more levels and branches of administration, multiple police forces, several courts of justice and region-based healthcare systems. Government adopted policies favouring the consolidation of its investments, as well as standards to support such policies. This led to the adoption of corporate systems and shared services across all departments. A robust and resilient ICT infrastructure forms the back-bone of an interconnected government. Most of these initiatives were implemented in partnership with the private sector. Government also established a strong governance framework and strengthened the eCommerce legislative framework. More recently, Government inaugurated a TIER III Data Centre,¹² hosting government infrastructure and information systems. This Data Centre is the fifth data centre in Western Europe and one of only 34 data centres worldwide certified to reach the Tier III Facility Certification.

¹⁰ The term economic efficiency refers to the use of resources so as to maximize the production of goods and services - Sullivan, Arthur; Steven M. Sheffrin (2003). *Economics: Principles in action*.

¹¹ Business angel is an affluent individual who provides capital for a business start-up.

¹² Tier III Facility Certification verifies that each and every component within the MITA Data Centre can be maintained, replaced or upgraded without disrupting the service.

Public projects are most fruitful when they are owned and funded by the respective government entity (as opposed to a more prescriptive, centralised entity) and driven by business objectives. In order to widen government efficiency, ICT champions are required in important decision-making positions and ICT strategies need to be integrated into overall government policy.

Malta is considered one of Europe's high performers in delivering eGovernment. The country is constantly improving its eGovernment platform to ensure that the number of services available online can increase without a proportionate increase in cost and complexity. The platform's architecture promotes reusability and scalability. In the eGovernment Benchmark 2012 report, Malta ranked first in four benchmarks (user-centric government, transparent

government, citizen mobility, business mobility) and second in the enablers benchmark. The 2012 report also highlighted that eGovernment users are expecting more from the services being supplied. Statistics from Eurostat highlight that the take-up of public online services by citizens is below the EU average. Malta ranked 18th (Fig. 6) in terms of percentage of individuals using eGovernment services and 15th (Fig. 7) in terms of enterprises using the Internet to interact with government. The messages are clear. Users want to interact on everything from health and education to security and tax. They expect government to focus on finding out what citizens want, rather than deciding what they need. Citizens are also expecting government to cut red tape. The development of Digital Government has to be hand-in-hand with efforts to reduce bureaucracy.

Fig. 6

USE OF EGOVERNMENT BY INDIVIDUALS

Source: Eurostat

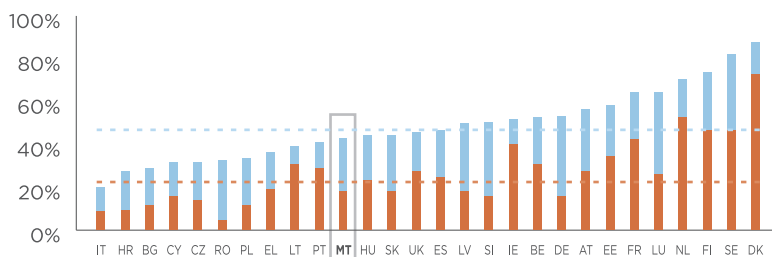
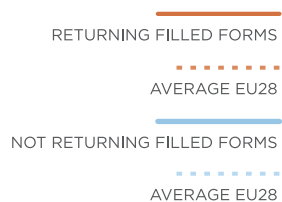
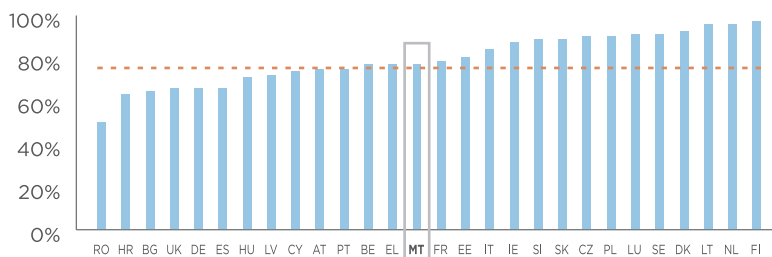


Fig. 7

ENTERPRISES USING THE INTERNET FOR INTERACTION WITH PUBLIC AUTHORITIES

Source: Eurostat



HARNESSING NEW PARADIGMS

The drive of the European Commission to accelerate interoperability, making systems and organisations work together, poses additional challenges and opportunities. It nurtures the concept of connected government through the alignment of departmental processes, standardisation, discovery and reuse of ICT assets and continuous rigour in improving the level of trust in the services provided by the public sector. Implementation of information systems within the public sector needs to incorporate the principles and recommendations of initiatives such as the European Interoperability Framework, European Interoperability Strategy and the semantic initiatives promoted through the European Commission’s Joinup platform¹³.

National technological infrastructure is in a good shape and compares quite favourably at an international level (Table 1). Malta has an impressive proliferation of mobile telephony and Internet access. Similarly, there is high digital confidence by consumers. By 2012, the mobile penetration rate in Malta reached 132%, slightly higher than the EU average of 130%¹⁴. In 2012, 77% of households had access to the Internet – slightly higher than the EU27 average of 76%. In this regard, the main concerns are the dependence on other countries for Internet connection, the capacity of international connectivity, the affordability of broadband for users and the lack of local content for the web and mobile devices¹⁵.

Indicator	Malta	EU Average	Malta Ranking
Mobile Penetration Rate	132%	130%	13th
Households having access to Broadband Internet	77%	72%	7th
NGA lines as a % of total fixed broadband lines	47%	20%	7th

Table 1

The new enterprise ICT landscape of cloud services, mobility and BYOD, and social media usage, creates very different types of network traffic to the traditional mix of in-house client-server workloads. Architecture and networks need to evolve to keep pace. Not only is more bandwidth required to accommodate the workloads involved, but also time delay must be avoided. Lower latency, particularly over wide-area networks, is needed to ensure good response times for cloud-based applications and other services.

¹³ JoinUp is the sharing and re-use interoperability solutions for public administrations platform (<http://joinup.eu>).

¹⁴ Source: European Commission

(<http://ec.europa.eu/digital-agenda/sites/digital-agenda/files/DAE%20SCOREBOARD%202013%20-%20SWD%202013%20217%20FINAL.pdf>).

¹⁵ The term ‘mobile devices’ within the context of this document includes mobile phones, tablets, laptops, ultrabooks, etc.

RAMPING UP ICT-DRIVEN INNOVATION

The budget allocation for ICT faces competition within government, placing an onus on departments and entities to make the most efficient use of both national and EU funds. Participation in EU-funded projects by government bodies may need increased resource and legal governance support. Government needs to consider innovative means to procure ICT services, explore the feasibility of private funding and public-private partnerships, and consider the prospect of re-using and sharing with other countries.

In the past, R&I strategies for ICT had been identified as a priority area. In the National Research & Innovation Strategy 2020, ICT is now singled out as an enabling technology for all sectors because of its potential to innovate industries. Since Malta's size cannot sustain the entire R&D life cycle, efforts should be directed to applied research that is closer to the market¹⁶ and in existing areas of strength that could enhance Malta's profile as a centre of ICT excellence. Many companies in Malta associate R&D to the closed innovation model of larger companies and multinationals. In comparison, open innovation approaches are more collaborative and leverage complementarities, and are, therefore, more adaptive to the needs of small businesses. Combining industrial innovation with educational policies and focusing on areas of strength (smart specialisation) increases the chances of Malta and its industrial base (both ICT and non-ICT) gaining a competitive advantage through differentiation.

The contribution of ICT towards energy efficiency in Malta is still marginally low. ICT offers many opportunities to offset the costs of energy through green ICT measures, such as, energy efficient equipment, virtualised environments, grid computing, cloud computing, home automation systems and advanced virtual services.

¹⁶ Source: MCST 2011.

MAXIMISING OPPORTUNITIES

Malta's ICT priorities are guided by government strategic priorities and the Europe 2020 Strategy flagship initiatives. More specifically these tie in with the Digital Agenda for Europe and the Innovation Union. Malta already has strong regulatory authorities and agencies including the LGA, the MCA, the Government's IT arm, MITA and various other successful endeavours such as the eSkills Malta Foundation, upon which it can successfully build.

The expectations of what ICT can deliver, are higher than ever and are likely to keep on growing. The main elements are in place for the industry to prosper. The challenges now are to prioritise and implement the missing elements. Malta's ICT industry must emerge from its plateau state and move quickly to exploit opportunities. It needs to build on its strengths, minimise its weaknesses and aim for sustained growth.

3

THE DIGITAL MALTA VISION

Digital Malta is a vision for the country in 2020 when:

“Malta will prosper as a digitally-enabled nation in all sectors of society.”

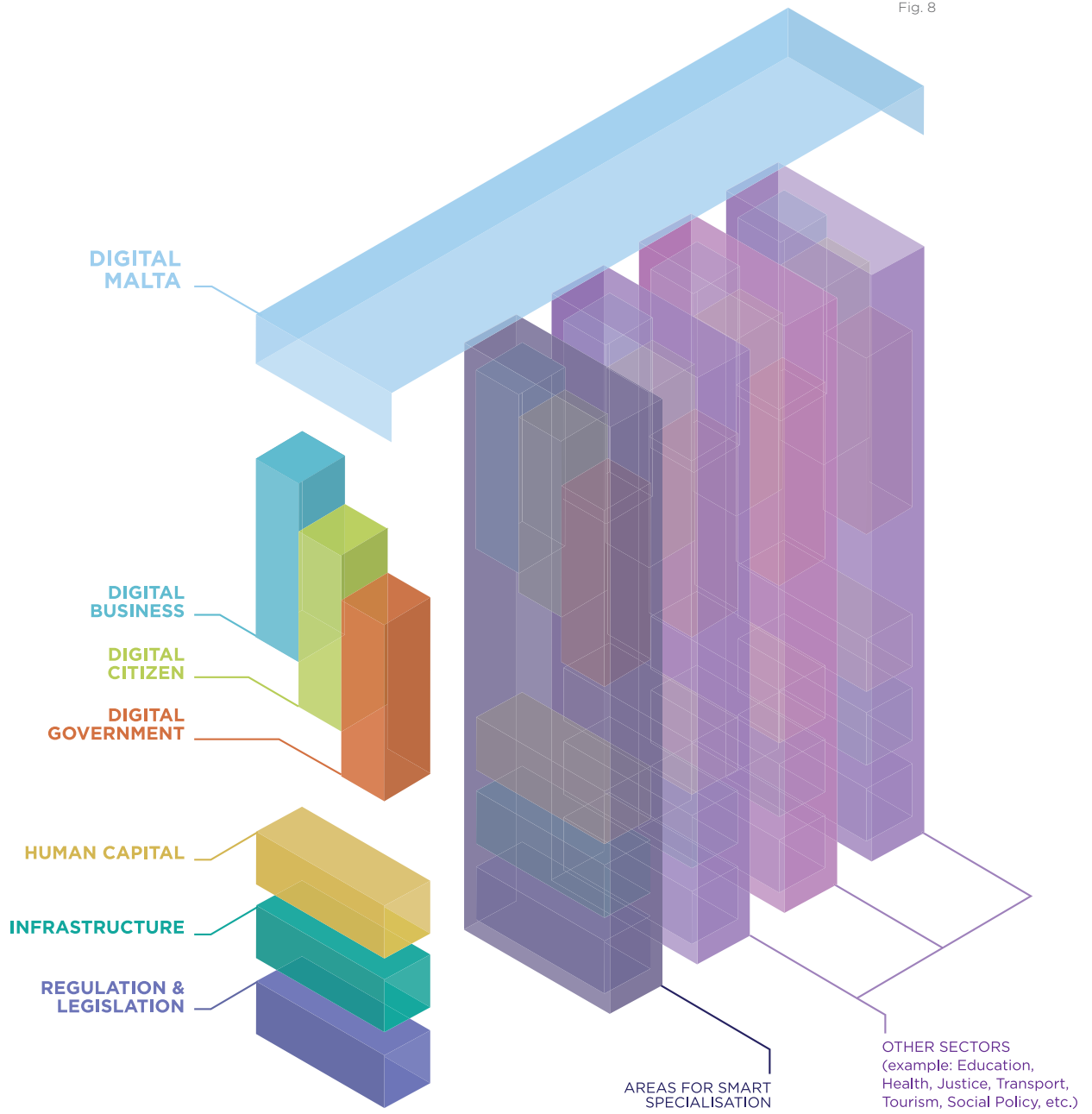
This is an exciting goal, advancing the nation’s digital economy to let business prosper and improve the quality of people’s lives. To meet this vision there is a need to address the most pressing strategic issues and capitalise on digital opportunities.

3.1 STRATEGIC THEMES

Digital Malta will take ICT policy development and implementation to a higher gear, meeting the expectations of all - the Citizen and civil society, Business and government. This vision will be enabled by supportive regulation and legislation, sound infrastructure and productive human capital. These building blocks will empower stakeholders to collaborate both within and across sectors.

This is represented by Fig. 8:

Fig. 8



Digital Malta is built upon three vertical strategic pillars with clear goals to:



Improve the wellbeing of **Citizens** and civil society. Everyone, including vulnerable and minority groups, will benefit from a higher standard of living. Basic digital skills will empower citizens to seize opportunities presented by technology and digitisation. Digital services will be affordable, secure and accessible to all regardless of skill and economic means. Local digital content will be encouraged.



Transform the way **Business** operate. Digital Malta will increase competitiveness and boost the attractiveness of local industry. It will promote more start-ups, attract foreign investment, enable strategic alliances, encourage angel investment and nurture niche service providers. Business will be encouraged and supported to exploit (i) the opportunities of the European Digital Single Market, (ii) Malta's strategic location in the Mediterranean, with ready access to the European and North African markets, (iii) Government's strategic alliances with foreign ICT organisations, (iv) opportunities to expand into new or bigger markets.



Enhance the delivery of **Government**. Better application of digitisation will result in reduced bureaucracy, increased efficiency and transparency. The public service will be closer to civil society and enterprises, improving the government's decision-making processes. Open Government and eDemocracy will be facilitated. On-line government services will be more accessible through the use of smart devices and mobile-friendly applications as well as websites and social media. Government's technological capabilities will be widened to include open-source, cloud computing and big data concepts. Information sharing across government systems and services will be promoted, as will be the re-use of public sector information by third parties.

These vertical strategic pillars need to be supported by a suite of enabling / driving forces:



Regulation & Legislation

Of central importance will be government's direction and priorities at a Strategic and Digital Policy level. Regulation and legislation will ensure an empowered digital society is realised. Good ICT governance will be promoted, with judicious use of resources and participation by all stakeholders. International best practices will be adopted.



Infrastructure

Infrastructure services need to be accessible, reliable, secure, affordable and resilient. They shall provide for disaster recovery where appropriate. Investment by private sector, will ensure fast broadband, wifi, next-generation access and robust government information systems architecture.



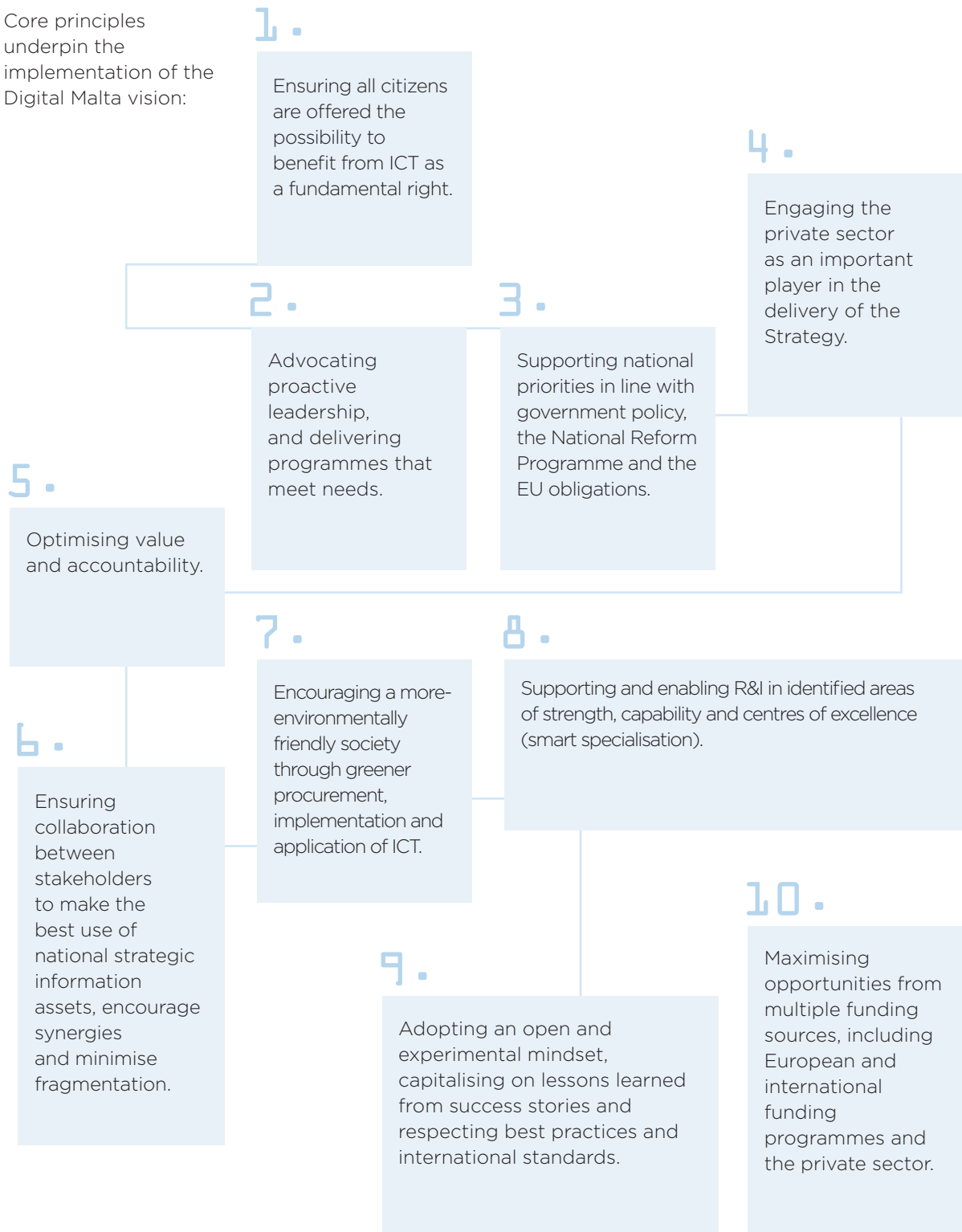
Human Capital

It is important to invest in people to ensure the supply of eSkills to meet the future needs of different sectors. Action will be taken to develop a high quality specialised skills base, maximising employment opportunities, with an emphasis on increasing female participation and tackling inequalities.

The portrayal of this six-pillar model, with a three-dimensional perspective, carries through to sectors such as health, education, transport, justice, welfare and taxation, and themed areas of specialisation identified in the 'National Research and Innovation Strategy 2020'. The diversity of each area and sector will be taken into account when tailoring initiatives.

3.2 UNDERLYING PRINCIPLES

Core principles underpin the implementation of the Digital Malta vision:



4

DIGITAL CITIZEN

4.1 GOALS

Digital technologies can improve the quality of life of all citizens. Every Maltese, irrespective of age, gender, sexual orientation, disability, education, economic means and race should grow as a digital citizen with rights, responsibilities and abilities to access and use ICT. Digital technologies must serve as a social equaliser, enabling everyone to participate and contribute in community activity.



4.2 GUIDING PRINCIPLES

A.

Citizens will be supported to:

- i. Adopt digital technologies to help with their work and improve their quality of life.
- ii. Create value content that can be accessed through digital means.
- iii. Collaborate with others to make the Internet a safer place for everyone.
- iv. Re-use public sector information while respecting privacy legislation, national security and the need to protect intellectual property rights of third parties.
- v. Be innovative in applying digital technology.

C.

Barriers that stop citizens from exploiting the benefits of the Internet must be removed.

B.

When planning and implementing digital initiatives, feedback from citizens and civil society will be sought.



Improve the wellbeing of **Citizens** and civil society. Everyone, including vulnerable and minority groups, will benefit from a higher standard of living. Basic digital skills will empower citizens to seize opportunities presented by technology and digitisation. Digital services will be affordable, secure and accessible to all regardless of skill and economic means. Local digital content will be encouraged.



4.3 ACTIONS

ENHANCING DIGITAL LITERACY AND SOCIAL EQUALITY

Achieving widespread digital literacy is vital for inclusivity and social cohesion. For example, digitally competent workers and digitally competent citizens can be more successful in the job market and contribute more effectively within the community. Those without digital competences are in danger of falling behind.

ICT offers people the tools to overcome limitations.

- 1. Basic level of ICT competence** An education and awareness programme will be launched to boost ICT competences, media literacy and confident, critical and safe use of the Internet. The programme will be implemented at community level. Vulnerable groups will be a major focus.
- 2. Empowering the young through a safer Internet** Digital Citizenship will become part of the National Education Curriculum, to equip children and youths with the abilities to interact and use the Internet safely and intelligently. Parents and carers will be involved together with educators and youth workers. This action will stimulate the production of creative online content, empower the younger generation and help create a safer environment. With the support of competent authorities this measure will help combat cyber child abuse and exploitation.
- 3. Empowering vulnerable/minority groups and the elderly** Initiate an ongoing programme designed to assist every citizen, in particular the ageing and the vulnerable to harness the potential of ICT. Appropriately equipped ICT access and training centers will be set up within local communities to support the programme.
- 4. Accessibility and Assistive Technology** Internet accessibility standards will be promoted to enable everyone, irrespective of disability, to navigate and access content to access and use of assistive technologies will be promoted and facilitated to help independent living of the elderly and vulnerable groups. This will also stimulate market demand for diverse, affordable technologies.

ACCESS FOR ALL

Every citizen, irrespective of age, gender, sexual orientation, disability, race, economic means and employment should have the opportunity to access and make use of ICT for their daily needs.

- 5. NGA Networks** There will be promotion of NGA networks by demonstrating their potential applications and by supporting their introduction in homes, offices and public buildings.
- 6. Free access to wireless Internet** There will be free access to wireless Internet in public buildings, main squares and many public spaces around the islands.
- 7. Portable devices for children** Portable devices will be provided for children, their teachers and LSAs as part of the government's vision of transforming formal education through the use of digital technologies.
- 8. Citizen Engagement** Contact with citizens and between citizens will be promoted, especially through the use of mobile apps and social networking websites. Guidelines on social media strategies for local government and NGOs will be developed, encouraging them to act as intermediaries in a more participative civil society.
- 9. Promote innovative ICT applications** Innovative ICT applications that lead to a better lifestyle will be promoted in a joint partnership with the private sector. The initiative will focus on developments that enhance daily activities such as shopping, banking, commuting and entertainment.

STIMULATING LOCAL CONTENT

Relevant, alluring and engaging content drives people to make use of ICT. High quality local content will draw more people online. The Internet offers the opportunity to overcome economic limitations, and to reach households with greater ease. The Internet also offers unprecedented opportunities to digitally preserve heritage.

- 10. Developing online content** A programme will be established to support and stimulate the development of high quality online content that is appealing, educational and culturally distinctive. Government will support joint collaborations between public and private media providers to produce, stream or make available local digital content.
- 11. Maltese language tools** Government will facilitate the development and distribution of language tools to support the use of Maltese as a medium for teaching and learning, and therefore widening take-up of ICT in the Maltese language.

5

DIGITAL BUSINESS

5.1 GOALS

Malta's businesses will have a greater chance of success if powered by ICT. Local firms must be encouraged and supported to embrace ICT to transform themselves into digital enterprises. This will strengthen their competitiveness and make them more export-orientated. Local ICT companies have an important role to play in bringing about this change.



5.2 GUIDING PRINCIPLES

A.

Because of the country's size and limited resources, ICT should be used in a strategic way, as an enabler of growth and innovation, and as a driver of economies of scale and pools of knowledge.

B.

Collaboration between the main local players in the ICT field will be fostered. User communities, ICT specialists and other professionals in ICT-enabled or supporting services will be encouraged to pool their resources to focus on generating products and services which are not just technological, but adaptive and value creating and able to serve both business and everyday needs.

C.

All stakeholders must aim to develop an environment that is conducive to business. Partnerships within the EU and with other countries in the region should be established to provide a platform for cooperation.

ICT-based R&I investment needs to be directed at niches and sectors of the economy that are already strong and areas of specialisation identified in the National Research and Innovation Strategy 2020.

D.

E.

Business sustainability and growth will be facilitated, and emergent economic opportunities will be exploited.

Students and young entrepreneurs will be encouraged and supported to make use of local innovation/incubation centres.

F.

G.

Local stakeholders will be supported to participate in funding programmes supportive of local incubation centres and related efforts to gain international exposure.



Transform the way **Business** operate. Digital Malta will increase competitiveness and boost the attractiveness of local industry. It will promote more start-ups, attract foreign investment, enable strategic alliances, encourage angel investment and nurture niche service providers. Business will be encouraged and supported to exploit (i) the opportunities of the European Digital Single Market, (ii) Malta's strategic location in the Mediterranean, with ready access to the European and North African markets, (iii) Government's strategic alliances with foreign ICT organisations, (iv) opportunities to expand into new or bigger markets.





5.3 ACTIONS

TRANSFORMING BUSINESS

Demographic change, globalisation, and more recently, the worldwide economic crisis have placed strains on industry. There have been radical changes in societal patterns and technology, leading to changed business models and increased competition. The business landscape is complex but industries will always seek to identify opportunities to capitalise on. ICT can serve as an important enabler for businesses in their transformation.

- 1.2 . ICT initiatives for sectors facing stiff competition** Government, working with industry, will organise a series of initiatives for sectors facing stiff competition (e.g. manufacturing, construction and retail) to help them benefit from ICT.
- 1.3 . Forum for the transformation of industries through ICT** A forum will be established, comprising of executives from leading local firms and industry representative bodies. The forum's mandate will be to develop programmes to raise awareness about how ICT can help industries transform themselves and become more profitable. The Forum will discuss issues such as internationalisation, eCommerce, the use of social networking as a business tool, the benefits of NGA networks, self-regulation, compliance with web accessibility guidelines, and supply chain management.
- 1.4 . ICT capability framework for SMEs and co-operatives** A framework will be developed to enable local SMEs and co-operatives to assess their ICT capability, human capital and ICT-enabled processes and technology. This will be supported by 'benchmarking' and roadmaps to enable these organisations to improve performance and derive increased ICT business value from their human, technical and operational assets.
- 1.5 . ICT training programmes** Government will support enterprises by administering ICT training programmes for their employees. The programmes will focus on unskilled and semi-skilled workers with the objective of improving their productivity, employability and mobility. They will also promote understanding of new business models enabled through technology. In parallel, ICT up-skilling and re-skilling programmes will be re-introduced.

SUSTAINING ENTREPRENEURSHIP AND ATTRACTING NEW BUSINESSES

The size, structure and type of ownership of many local enterprises, a tendency towards risk-aversion and a perceived lack of funding, support mechanisms and incentives all run counter to the culture of entrepreneurship needed for an innovation economy and towards attracting FDI.

There are a number of ICT-themed measures that can be taken to support and improve the level of business entrepreneurial activity in Malta.

1.6 • Supporting entrepreneurship

Collaborating with stakeholders, government will:

- Invest resources to cultivate a widespread entrepreneurial mind-set, allowing for the launch of more ICT start-ups and young high-growth ventures exploiting ICTs. Special emphasis will be devoted to Gozo-based entrepreneurial initiatives in view of the island's difficulties in developing a mature ICT industry.
- Facilitate improved 'access to capital' programmes for start-ups, micro and small firms. This includes the setting up of a business angels network, incentives for crowd-funding and other investor schemes.
- Provide firms with incentives to deploy advanced ICT services in unprofitable areas. These could be interest-free credit, subsidies, or preferential tax rates.

1.7 • Attracting FDI in ICT

Measures will be taken to attract foreign ICT companies with the objective of transforming Malta into a regional hub for technological cooperation and trade. These will include:

- Corporate packages, structures and business models that target FDI in ICT ventures, start-ups, ICT educational collaborations and niche markets such as digital games, mobile apps and other creative content.
- Actively supporting SmartCity Malta and others involved in incubation or innovation activities.

1.8 • Cloud Computing

The government in partnership with industry will develop a strategy on 'Cloud Computing' aimed at establishing Malta as a world-class hub for the provision of cloud computing services, boosting innovation and productivity across the digital economy.

1.9 • Digital Gaming

Execute a Digital Games strategy in an attempt to strengthen what Malta offers operators in the sector, including improving the specialist skills base.

ECOMMERCE - GOING GLOBAL

The local ICT Industry is a vital part of the economy, but it must target international markets if it is to advance. Digital technologies provide significant opportunities for growth through exporting.

eCommerce extends boundaries. Products and services can be easily marketed and traded over the Internet, expanding markets from neighbourhood to global. While local firms can gain substantially from such opportunity, they also need to manage the challenges of eCommerce.

- 20 • Widening horizons** Government, working with industry bodies, will develop policies and incentives to:
- Enable ICT clusters to flourish. Technology development, innovation and internationalisation should be the main focus of clustering activity. Support may include seed funding, market intelligence services, and internationalisation services.
 - Exploit Malta's eGovernment expertise to develop training and consultancy services for other countries, especially those with cultural or traditional links in the Mediterranean or the Commonwealth.
 - Promote the concept of 'Born Global' products and services.
- 21 • ICT-focused incentive schemes** Incentive schemes and voucher-based credit lines will be developed to enable local SMEs and co-operatives to benefit from free or subsidised consultancy services. This will help them adopt digital technology and innovative business models to both establish themselves online and internationalise their products and services.
- 22 • eCommerce markets** Government and industry stakeholders will:
- Develop measures to sustain and grow the local eCommerce market on both the supply and demand sides.
 - Implement initiatives to assist and further drive the adoption of eCommerce by business sectors with the potential to capitalise on web technologies and penetrate foreign markets.
- Identify opportunities for Malta to attract business activities that operate or support global eCommerce markets.
- 23 • Emerging electronic transactions** Government, working with payment providers, will develop an education programme to explain and promote different forms of electronic transactions and emerging monetisation models. The programme will explain business models, technologies, costs and risks.

STIMULATING RESEARCH & INNOVATION

Besides being a sector in its own right, ICT is a horizontal enabler for R&I. There needs to be continued investment in both ICT infrastructures, and innovation using ICT, as identified in the National R&I Strategy 2020. The two lines of investment are mutually reinforcing, as investment in ICT infrastructure and human capital provides the way for ICT-based innovation.

24. Harnessing international R&I funding

Local ICT companies need to take advantage of pan-European and international R&I funding frameworks and industrial development funding opportunities. To help in this, government will:

- Provide logistical and brokerage support.
- Offer incentives to companies to invest time and human resources researching and developing innovative products, processes, and services and new marketing methods.

25. Open innovation

Government will set up a multi-stakeholder Innovation Centre to offer incentives for ICT-themed R&D, idea-generation, incubation and innovation with a view towards co-creation and open innovation. Its purpose will be to:

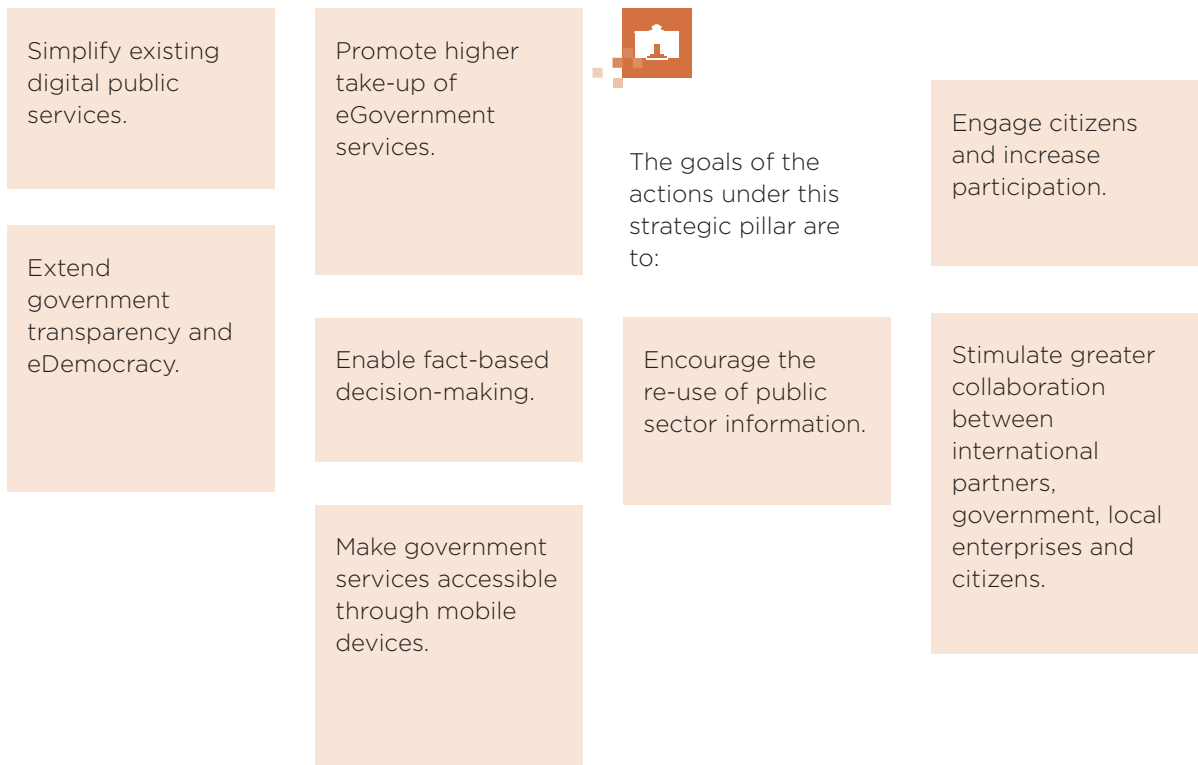
- Create an environment to enable open collaboration by enterprises, academic institutions and public bodies wishing to engage in R&I activities, particularly projects requiring testing and validation in real-life settings.
- Attract multi-national enterprises, contributing different technological platforms and expertise.
- Provide mentorship, specialised training and an alternative ICT incubation facility for young entrepreneurs, students and start-ups wishing to test and demonstrate their innovations in a live environment.
- Serve as a networking hub and a show-case of locally developed talent and products.



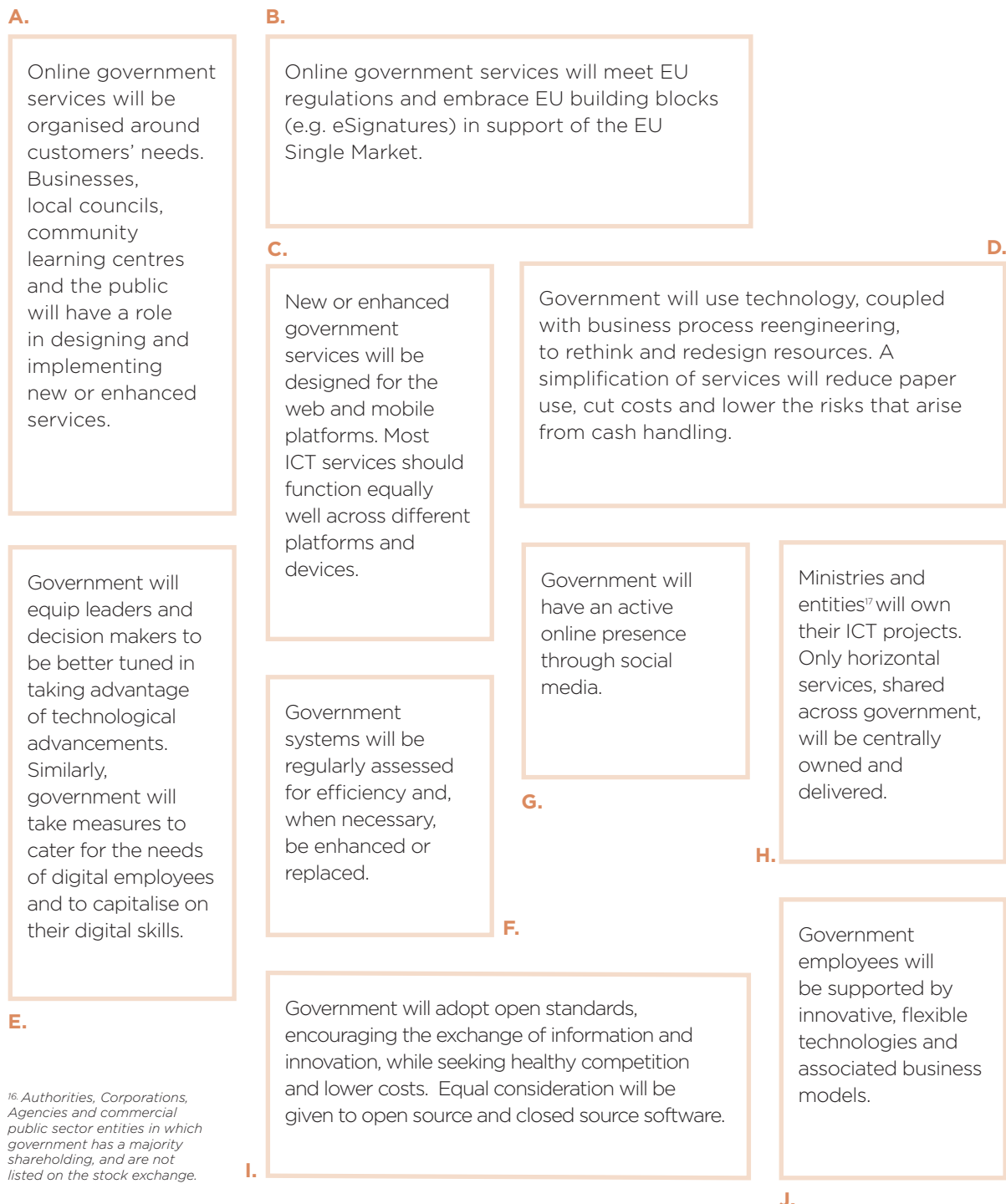
DIGITAL GOVERNMENT

6.1 GOALS

Government services should be designed around the requirements of the people. They need to be more user-friendly and less burdened by red tape. They should be accessible through multiple channels. The concept of service to the community needs to be expanded so that government involves citizens and businesses in decision-making processes. In addition, public data, which government creates, designs and manages, should be openly shared across entities and authorities, and externally with third parties for their commercial re-use. This will prevent costly duplication and re-invention.



6.2 GUIDING PRINCIPLES



¹⁶ Authorities, Corporations, Agencies and commercial public sector entities in which government has a majority shareholding, and are not listed on the stock exchange.



Enhance the delivery of **Government**. Better application of digitisation will result in reduced bureaucracy, increased efficiency and transparency. The public service will be closer to civil society and enterprises, improving the government's decision-making processes. Open Government and eDemocracy will be facilitated. On-line government services will be more accessible through the use of smart devices and mobile-friendly applications as well as websites and social media. Government's technological capabilities will be widened to include open-source, cloud computing and big data concepts. Information sharing across government systems and services will be promoted, as will be the re-use of public sector information by third parties.





6.3 ACTIONS

CITIZEN & BUSINESS-CENTRIC GOVERNMENT

Government will expand its eco-system of easily accessible digital services and content. Customers will be provided with a seamless and integrated web experience across government websites, and on mobile technologies too.

Online services will be more cost effective with wider benefits for customers.

26. **Transacting with government**

Citizens and organisations will be able to transact securely with government using different channels. The take-up of online services will be encouraged by making them easy to use and available on mobile devices. These services will include online forms, ePayments and eInvoicing.

27. **One-stop shop**

Citizens and businesses will benefit from a one-stop shop concept. They will be able to access services from their home or office, or through agents.

Practices such as 'one face to government', 'one-login', 'service-personalisation' and 'ask-only-once' will be the driving force.

EFFICIENT GOVERNMENT

Using technology and business process reengineering, Government will reduce bureaucracy and implement leaner processes, with the aim of offering new and improved public services.

Public officials will be empowered to share knowledge and collaborate within government and across agencies to serve customers better.

28 • Collaborative digital environment

Government will work with stakeholders to:

- Assist departments and entities to adopt technology that integrates cross-departmental services.
- Facilitate the use, management, retention, preservation and archiving of born-digital records so that these remain accessible and usable.
- Protect corporate knowledge, and improve data security, integrity, accessibility, traceability and archiving. Industry standards for records and information management and business classification scheme will be adopted.
- Strengthen knowledge sharing.
- Enable workflows.
- Provide collaborative environments for unified working across multiple devices and media-types.

29 • Business Analytics

Public officials will be equipped with the right tools to analyse government data. This will support decision-making and help identify gaps and opportunities.

30 • ICT Innovation in procurement

Government will use its position as a major procurer to stimulate demand for innovative ICT. It will encourage collaboration between local players and, as an early adopter, it will act as a showcase for locally-produced technology.

Innovative policies will improve procurement cycles and deliver better value. The eProcurement framework will be extended to cover eOrdering, eInvoicing and ePayments.

31 • Strategic Alliances

Government will continue to explore opportunities for cooperation, alliances and partnerships with reputable multinationals so as to maximise the return on investments and adopt international best practices.

OPEN GOVERNMENT

Government is committed to be transparent, and to encourage public engagement. Online engagement will increase using digital technologies such as social media and crowd-sourcing, soliciting contributions from many. Communications and eParticipation activities will be designed to promote better development of public policy, increase public trust and encourage citizens and businesses to collaborate with government.

In line with EU regulations, government will open up public data for use by private organisations and the general public whilst promoting innovative application of such data.

32. Open Government Data

In addition to facilitating the sharing of data across public administration, government will make public sector information available to all as allowed by law. Structured data will be published in a way that it can be interlinked (Linked Open Government Data) and become more useful to Government entities, third parties and respective systems.

The adoption of Big Data technologies will allow complex data to be processed, improving decision-making in critical areas such as finance, healthcare, transport, utilities and the environment.

33. eDemocracy

Government is committed to using ICT to encourage citizens to take part in democratic decision-making. Initiatives will be implemented to enhance the visibility, transparency and accountability of government.

ESSENTIAL GOVERNMENT SERVICES

Government entities providing social initiatives and essential services such as education, healthcare, welfare, justice, tourism, utilities and transport may require ad hoc ICT programmes. The input of ICT should be seen as an opportunity to serve customers and cut across boundaries.

- 34. Sector specific ICT programmes** Sector specific ICT programmes or strategies will be developed by collaborating with all stakeholders. There will be a philosophy of cutting across ministerial boundaries. The ultimate aim will be to secure consistency, buy-in, effectiveness in implementation and value to citizens and businesses as the ultimate beneficiaries.
- 35. eLearning** A complete ICT infrastructure will be provided for educators, students and parents, encouraging a digital mindset and widening learning opportunities. Educators will be supported to make full use of eLearning platforms and other digital learning technologies.
- 36. eHealth** Citizens will be empowered by providing them with secure and easy access to their health records. Similarly, healthcare providers will gain secure and seamless access to the patients' records.
- 37. Transportation** Government will use digital technology in land, sea and air transport. Special emphasis will be given to the deployment of Intelligent Transportation Systems for improving road safety, traffic flow and in-country travel.



REGULATION AND LEGISLATION

7.1 GOALS

Digital Malta requires a supportive regulatory and legislative framework.

Continuously enhance the regulatory framework in Malta as it affects ICT, whether directly or indirectly.

Protect rights and freedoms.



The goals of the actions under this strategic enabler are to:

Ensure that the Internet remains universal, innovative and open.

7.2 GUIDING PRINCIPLES

A.

ICT legislation and policy will be non-discriminatory and technology neutral. It will foster value creation, innovation and growth in all industries and society at large.

B.

Legislative measures and regulatory strategies pursued in other jurisdictions will be monitored and evaluated to see if local legislation needs improving.



7.3 ACTIONS

LEGISLATIVE INFRASTRUCTURE

The benefits of the Internet are best reaped when regulatory and legal frameworks ensure universal access, transparency, openness and economic sustainability. Specific actions will be required.

- 38. Digital Single Market** Malta will seek to maximise the benefits and opportunities deriving from legislation adopted within the EU. As at 2014, these include:
- The Data Protection Framework.
 - The Electronic Identification and Trust Services Regulation.
 - The Information Society Directive.
 - Regulation concerning the European single market for electronic communications and achieving a Connected Continent.
- 39. Radio spectrum for mobile data communications** The regulatory framework will ensure sufficient radio spectrum for mobile data communication while safeguarding the availability of spectrum for public security.
- 40. Digital legislation and contracts** Government will work with stakeholders to:
- Have a process whereby new laws, once enacted, are digital by default.
 - Evaluate existing laws to align them with the Digital Malta vision.
 - Enable contracts, which are subject to the formalities of the Notarial Profession and Notarial Archives Act, to be in digital format from the outset.
- 41. Infrastructure based competition** The legal and regulatory framework shall support investment in new broadband networks and stimulate infrastructure-based competition.

INTEROPERABILITY AND STANDARDS

The fast pace of ICT development requires continuous review of industry standards. Government has a leadership role to play. It must ensure standards and policies produce optimal returns on investment in systems architecture and data that is open and interoperable.

42 • Standards and Good Practice

Government will collaborate with stakeholders to support and promote:

- National and EU cross-border interoperability.
- ICT standards based on industry best practices.
- Green ICT.

A ROBUST INTERNET

Challenges posed by advancements such as cloud services, portability and social media require legislation that safeguards and protects citizens' data without inhibiting entrepreneurial initiative and creativity. Intellectual property and content will be protected through a regulatory framework that will also ensure a level playing field for enterprises to thrive and prosper.

43 • Cyber Crime Legislation

Government will review existing legislation to ensure relevance and effectiveness in the cyber world, for example in dealing with cyber bullying.

44 • Digital legislation and regulation

Government will provide measures to maintain privacy, safety and security while surfing, transacting and operating on-line. Legislation will address several matters:

- Safeguarding intellectual property rights.
- Patents.
- Sensitive and personal information.
- Cloud Computing and data ownership.
- Contentious content.
- Net Neutrality.
- Vendor Lock-in and Exit Management strategies.
- Online contracts and license agreements.



INFRASTRUCTURE

8.1 GOALS

Communications and information infrastructure is required to support government targets for economic growth and social development.

Provide the necessary foundations for a sound and prosperous digital ecosystem.



The goals of the actions under this strategic enabler are to:

Introduce cost effective and timely technologies to keep Malta competitive and vibrant as a digital nation.

Implement infrastructure that is resilient, performs and capable of supporting future demands.

Provide safe, accessible and trustworthy services, while protecting fundamental rights, freedom of expression, personal data and privacy.

8.2 GUIDING PRINCIPLES

A.

Government and the private sector will invest in network infrastructures and technologies, keeping up with national and international developments, providing Maltese citizens with platforms that are accessible, reliable and secure.

High quality service and affordable access will be driving forces.

B.

The design and implementation of government network infrastructure and applications will be based on open standards to ensure interoperability and collaboration at national and international level.

C.

Government will lead by example, adopting high quality standards and embracing important technology principles such as abstraction, loose coupling, cohesiveness and generality.

D.

8.3 ACTIONS

A NATIONWIDE NGA NETWORK

The revolution in communications technology in the past few decades has created enormous social and economic opportunities. Technology is always evolving, and new investments are required if the country is to keep abreast of developments and provide industries and citizens with future-proof communications infrastructure.

- 45. Supporting NGA Networks** The MCA regulatory regime will foster innovation and investment to support the development of NGA Networks in Malta. It will have the objectives of ensuring competition and affordable access to these networks.
- 46. Broadband Supply and Demand** The MCA will monitor supply and demand of broadband, anticipating change, supporting development and facilitating the deployment and development of NGA Networks in Malta.
- 47. IPv6** Government will promote deployment of the IPv6 protocol, for identifying and locating computers on networks and traffic routes across the Internet. This acknowledges the need to prepare for an 'Internet of Everything,' where all objects connected to the web must be uniquely identified.

SPECTRUM AND NETWORKS

Malta will have an infrastructure that guarantees citizens and business opportunities for socio-economic development.

- 48. Network Infrastructure Sharing Opportunities** A framework to facilitate and regulate network infrastructure sharing will be established to safeguard the long-term growth and development of the telecommunications sector, while ensuring healthy competition.
- 49. Safeguarding Networks** Risk mitigation measures will be introduced to safeguard networks from damage caused by third-party operations.
- 50. Quality of Service** End-user interest in the electronic communications sector will be safeguarded by improving the quality of information available to them and ensuring service providers meet contractually agreed QOS levels.



INTERNATIONAL AND REGIONAL CONNECTIVITY

Submarine cables are the backbone of the communication networks and the life blood of the Maltese economy. A better connected environment will contribute greatly to the economy's efficiency and provide business opportunities.

51. International Connectivity

Opportunities for new submarine cable routes, connecting Malta to mainland Europe or North Africa, will be evaluated. The objective will be to strengthen the country's connectivity to international networks and hubs, increase resilience and improve investment.

52. Connectivity between Malta and Gozo

A feasibility study will determine optimal data connectivity between the Maltese islands with a particular focus on resiliency and bandwidth between Malta and Gozo. The outcome will guide the type and extent of investment to be made.

CYBER SECURITY

The Internet's huge footprint, its impact on society, and the ever increasing range of threats and vulnerabilities present a continuous need to protect cyberspace. A Critical Infrastructural Programme is needed with the participation of government and the private sector to ensure that confidentiality, integrity and availability of information and cyber systems are preserved. Cyber attacks pose a relentless threat to Malta's national security, economy and society. Cyber security is also crucial for protecting human rights, freedom of opinion, information and association, and for enforcing obligations in cyberspace.

53. National Cyber Security Strategy

Government will enforce a National Cyber Security Strategy, to help ensure a safer Internet, the protection of critical infrastructure, the rule of law, accountability and privacy. The main pillars will be designed to:

- **Combat Cyber Crime.** Law enforcement agencies will identify gaps and strengthen their capability to investigate and combat cybercrime.
- **Strengthen National Cyber Defence.** Public and private entities will be guided and assisted in strengthening their cyber defence capabilities.
- **Secure Cyberspace.** Higher levels of trust will be instilled through awareness programmes and the delivery of trustworthy, ICT-enabled services that assure confidentiality, integrity, availability and privacy.
- **Build Capacity.** The skills and educational frameworks required will be identified and developed.

GOVERNMENT SHARED INFRASTRUCTURE

Government will continue incrementally to enhance its infrastructure. It will draft a roadmap, based on emerging business and technological requirements, to design and implement the next generation of government ICT infrastructure.

54. Authentication Services

Government will:

- Simplify the process for authentication to access its online services.
- Work with banks and other organisations to develop a national electronic identity card as a trusted source of authentication.
- Bring authentication services into alignment with EU standards and allow fellow European citizens access using their national electronic identity.
- Develop a roadmap, aligned to likely technological advancements and emerging needs.

55. Trust Services

Services will be provided to facilitate the creation, verification, validation, handling and preservation of electronic signatures, electronic seals, electronic time stamps, electronic documents, electronic delivery services, website authentication, and electronic certificates.

56. Modernisation and Re-Use

Government will accelerate the modernisation of ICT implementations, maintain a cartography of ICT assets, and promote the re-use of mature local and EU established ICT building blocks using the Enterprise Architecture & Road-mapping Initiative of MITA.

57. Foresight

Foresight projects will be launched to identify how important ICT driven themes, such as identity and social networking, can be best used for stimulating economic growth.

58. Incubation of novel ICT driven solutions

Government will pilot ICT projects and embrace those that modernise public administration or promote economic growth. This will be delivered in collaboration with various EU-led programmes.



HUMAN CAPITAL

9.1 GOALS

The ability to develop and deploy educated and able workers is crucial in a knowledge economy. The skills and capacities that reside in people and that are put to productive use are important to create economic value in all sectors of society.

Help educators embrace technology and adopt new teaching methods for developing the skills of their students.



The goals of the actions under this strategic enabler are to:

Exploit e-content and technology to attract more people into lifelong learning.

Align the supply of STEM skills with the requirements of industries.

Increase female participation in STEM education and the workforce.

Develop a specialised skills base for spurring business development.

9.2 GUIDING PRINCIPLES

A.

The STEM skills and employment policy must be an integral chapter in national educational and employment strategies and policies.

B.

Individuals will be encouraged to take up ICT, and ICT-enabled professions, as a career.

A stimulating educational environment is needed to inspire creativity and innovation and encourage young adults to harvest their entrepreneurial skills.

The application of digital technologies needs to be embedded in all university, college and school courses, and non-formal learning environments.

D.

C.

Government must address labour market shortages and industry requirements, ensuring there is synergy between industry, educational institutions and other stakeholders.

E.

9.3 ACTIONS

BUILDING CAPACITY AND SKILLS

New skills are needed in an era of rapid economic and social change. Globalisation and technological advancements will drive the future. Students must be equipped to manage emerging technologies, and the jobs and professions that will emanate from them.

- 59. Integrating critical skills across educational and formative experiences**

Government will fund access to resources, training and industry readiness programmes. These will include apprenticeships and internships, and help with imparting skills such as problem-solving, computational thinking, and data and information processing. Soft-skills and aptitudes, such as intellectual curiosity, flexibility and e-entrepreneurship, will be woven into the fabric of formal education. Programmes will be supported and promoted in and after school, on and off campus, throughout the year, across public and private institutions. Projects and spin-offs, arising from such programmes, will be celebrated, for example through annual competitions.
- 60. Building national capacity in specialist skills-sets**

Through educational institutions and industry, government will support the creation of specialist educational pathways, addressing labour market requirements. Government will develop the curriculum and provide technical materials.
- 61. Investing further in and celebrating the education community**

Educators will be given opportunities and incentives to explore cross-disciplinary approaches, embracing technology. Innovative teaching and achievements will be celebrated. Local best practice will be shared.
- 62. Awareness-raising on eSkills education and careers**

Government will resource awareness campaigns about careers requiring eSkills and the education opportunities available. Target audiences will be identified by collaborating with stakeholders. Action will be taken to minimise the gender imbalance in the technology field.



STRENGTHENING THE WORKFORCE

Globalisation puts Malta's workforce in direct competition with workers in every corner of the globe. Competency requirements are constantly changing at every level of business. Investment will take place to strengthen the workforce. Government will:

- 63. Improve employability through lifelong learning and career support**

Work with educational institutions, community organisations and industry, to develop a Lifelong Learning Programme, with eSkills at its core, so as to improve worker employability in the digital economy. There will be a support framework of career guidance, financial incentives, flexible learning paths and intense use of eLearning. Special emphasis will be assigned to vulnerable groups.
- 64. Update the eCompetence Framework**

Continue investing in the Standards for ITalent, as the eCompetence framework for providing defined, visible career streams for individuals in the ICT profession. The framework will be updated to reflect European and international developments standards and reflect feedback from stakeholders. Industry and educational institutions will be encouraged to adopt this eCompetence framework. The standards will be promoted as occupational guidelines with easy-to-use tools for professionals and aspiring practitioners to map their skills portfolio with career development.
- 65. Promote excellence in the professionalism of the local ICT workforce**

Support mechanisms to develop excellence in the ICT workforce. The building blocks of the profession include the eCompetence framework, a foundational body of knowledge, ethics and education. Other supporting components will be explored, such as profiling tools, registers and portfolios for practitioners.
- 66. Quality assure for ICT educational programmes**

Ensure the adoption of quality assurance processes in the delivery of ICT educational and training programmes so that the content and materials are in line with industry demands. This will be managed through the educational authorities.
- 67. Validate technology-related experience and education**

Validate informal technology-related experience and education of ICT practitioners. This will be done jointly with the educational authorities and educational institutions.
- 68. Increase female participation**

Identify the main challenges women face to participate in the ICT workforce. Incentives will be offered to employers to recruit more women.
- 69. Take informed action**

Monitor demand for eSkills. Qualitative and quantitative research will be shared with stakeholders for co-ordinated action when needed.

REGIONAL HUB FOR HIGH QUALITY ESKILLS EDUCATION AND TRAINING

The global marketplace necessitates global citizenship. Internationalised educational institutions can provide students with global perspectives of disciplines and careers. Growth in international STEM education and training will broaden outlooks, strengthen educational institutions' offerings and, ultimately, improve national competitiveness.

- 70. eSkills education in other critical sectors** Government will embark on a plan to internationalise the Maltese eSkills educational sector to attract education tourism. This will capitalise on the success of the English-language educational tourism initiative. The plan will address the need to enhance Malta's attractiveness as an eSkills training destination, deal with deficiencies, and provide investment support for educational providers.

- 71. International ICT education programmes** Incentives will be provided for the creation of joint international ICT education programmes at vocational, academic and executive levels. These programmes will be carried out in co-operation with reputable international educational institutions.

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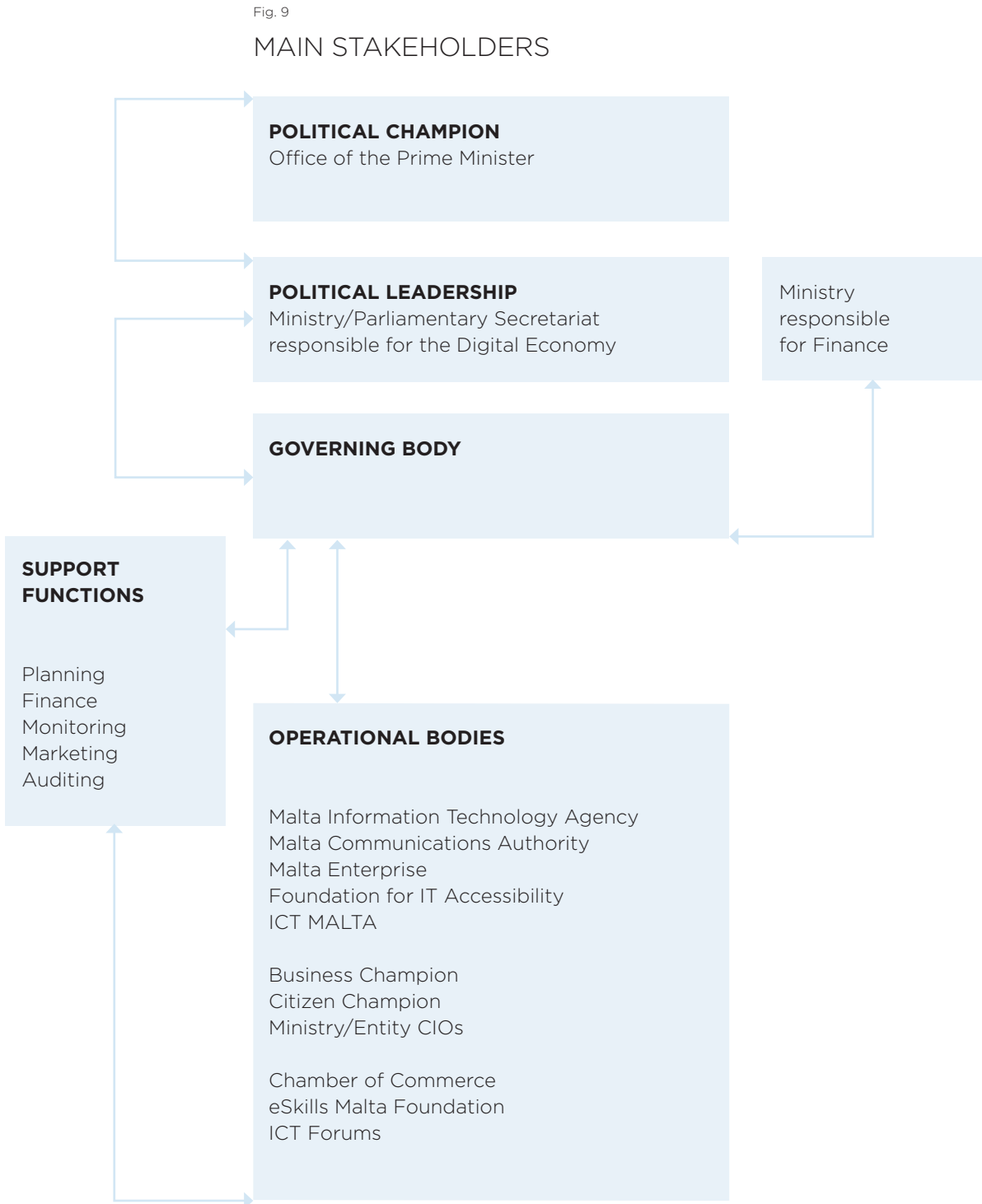
ATTAINING THE VISION

Everybody needs to work together to make **Digital Malta** a success. The Strategy is an enabler for the different bodies and organisations to achieve their objectives and as such should be deemed as an integral part of their operations.



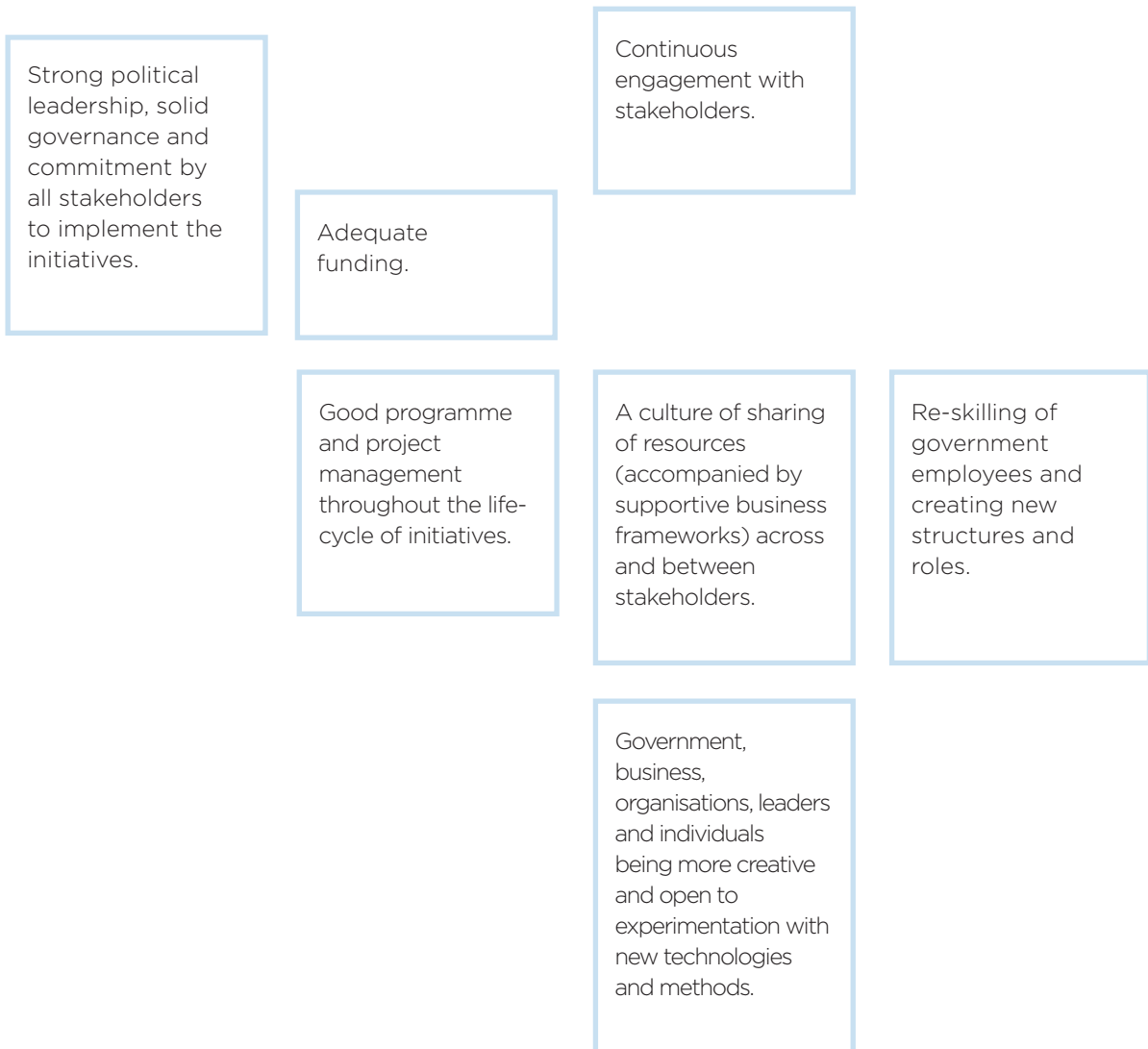


Fig. 9 depicts the role of the different stakeholders.



10.1 CRITICAL SUCCESS FACTORS

A suite of factors are critical for attaining the vision:



10.2 POLITICAL LEADERSHIP

Within the public sector, the goals identified in Digital Malta will be considered as high priority and strategic direction will be given.

Politically championing the Strategy at the most senior level, and securing ownership from the respective areas, is fundamental for success. The Cabinet, headed by the Prime Minister, will champion the attainment of Digital Malta through political will, supportive policy and adequate funding. The Ministry / Parliamentary Secretariat responsible for the Digital Economy will provide focus on ultimate goals, overall governance and the engagement of relevant parties.

Senior figures within government will own and be accountable for actions and initiatives.

10.3 GOVERNING BODY

Strong governance will support the leaders. It will enable management of the dependencies and interactions between players and mitigate the risks associated with adopting different policies and implementing various actions. Stakeholders need to work closely together to overcome challenges.

A governing body, representing the primary stakeholders, will be established. It will report to the Ministry / Parliamentary Secretariat responsible for the Digital Economy and will:

- Oversee the implementation of the Strategy ensuring the necessary commitment, engagement and collaboration of stakeholders.
- Provide leadership, mentorship and support to stakeholders in understanding and implementing the Strategy.
- Approve a programme of initiatives within the public sector on a yearly basis.
- Oversee progress and provide direction on major ICT investment.
- Develop a framework and tools to measure the benefits gained from the digital experience, and make the results accessible to all.
- Market and promote the Strategy and associated actions and initiatives.
- Celebrate and share success-stories.
- Re-calibrate the Strategy as necessary.

A sub-committee will be setup to determine yearly ICT budgets and to ensure savings from ICT projects are reinvested in ICT.

10.4 OPERATIONAL BODIES

The Digital Malta Strategy will be supported by a yearly 'Programme of Initiatives.' Initiatives will be identified and scoped by the respective owners and submitted to the Digital Malta Governing Body in the form of a business case for approval and prioritisation. Once this is done, the respective owners will take measures to secure the necessary funding and to drive implementation in line with the direction provided.

In this regard, at different stages of the Strategy timeline, various organisations, entities and individuals will be involved. A number of new functions will be established:

- **ICT Malta** will be set up on similar basis to Finance Malta. It will be led by the business community and will have objectives to:
 - Promote and market Malta to attract ICT investments;
 - Assist the local ICT industry to penetrate the global market;
 - Promote ownership of the Malta brand among all stakeholders;
 - Synergise business sectors to create ICT areas of strength (e.g. software development), to contribute towards economic growth.
- **Citizen and Business Champions.** Two individuals will be appointed to champion 'Digital Citizen' and 'Digital Business' activities. They will be the central contact point for initiatives within these two strategic themes and will lead their implementation.
- **A Digital Society Stakeholder Forum** will be established for civil society, government and industry to discuss how ICT is impacting society, and how it can be used to create better social cohesion. The Forum will look at eInclusion, digital citizenship and Internet safety; it will propose policy to government and encourage industry self-regulation.
- **A Forum for Internet Safety and minors** will be set up to bring together the MCA, the Commissioner for Children, FSWS, the Education Directorates, the Malta Police Force, industry representatives and others to share knowledge and to monitor developments. The Forum will put forward policy ideas and represent Malta on European bodies working in this field.
- An **FDI multi-stakeholder committee** will be responsible for designing corporate packages specifically targeting ICT multinationals. Special attention will be reserved for promoting and facilitating knowledge economy investments in Gozo. The committee will include stakeholders from public, private and independent bodies from both Malta and Gozo.
- An **entity will be responsible for the coordination of national cyber security efforts.** This entity will be also responsible for the creation, maintenance and governance of the National Cyber Security Strategy.
- A **Data Governance Council** will provide strategic direction for data related issues and decisions.

In addition, where appropriate, the remit, the strategic direction, the structures and the operations of existing organisations will be aligned in such a way so as to be in a stronger position to implement this Strategy:

- The **MITA** will continue to drive government's ICT policy, programmes and initiatives within Malta.
- The **MCA** will, in line with its regulatory remit, continue to ensure an optimal environment for the deployment of multiple high speed fixed and mobile networks, while promoting public and business uptake of ICT.
- **ME** and **MCST** will promote Digital Malta in their spheres.
- The **FITA** will be given a stronger role to build and promote accessibility standards across government and industry.
- The **Ministry and Entity's Office of CIOs** will be responsible for developing, managing and implementing the Ministry's ICT strategy and an ICT programme plan as directed by Digital Malta. The Office of CIOs will be strengthened to ensure that these Offices are in a position to successfully deliver.
- Structures responsible for **combating cyber crime** and supporting **Critical Information Infrastructure Protection**, especially those relating to CSIRT Malta, will be reinforced. Furthermore, National early warning **cyber security advisory capability** and **National law enforcement agencies** will be strengthened.
- The **Malta Internet Governance Forum** will serve as the national platform for the protection of human rights and democracy on the Internet. The Forum will be open to all local stakeholders. Its aims will include activities to promote data protection and privacy; coordinate cooperation against cyber crime and maximise the Internet's potential to promote democracy and cultural diversity.
- **eSkills Malta Foundation** - Government will transform the eSkills Alliance into a purpose foundation giving it more independence, strength and agility.

1.0.5 SUPPORT FUNCTIONS

The execution of the Strategy also requires the creation or strengthening of a number of support functions including:

- Planning and budgeting, monitoring and auditing, and marketing of the Strategy.
- Foundation of bodies with a similar aim of increasing proliferation of ICT across the island.

These support functions will work in liaison with the operational bodies to reap the benefits that result from continuous collaboration.





MEASURING SUCCESS

Digital Malta has bold goals in order to deliver a better quality of life and sustained economic growth.

The Strategy will be measurable and transparent, allowing all stakeholders to track its success.

It will continually be monitored by the Governing Body. Reports will be presented on qualitative and quantitative assessments and progress achieved.

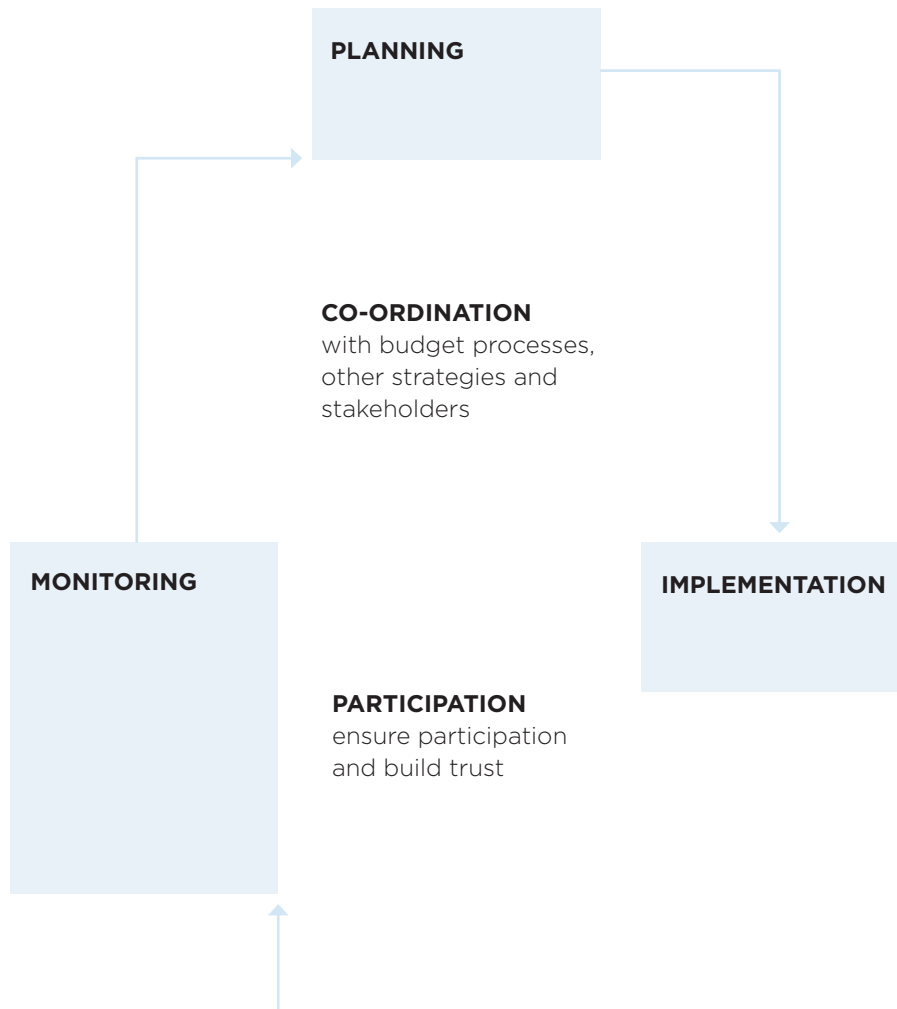
The monitoring will also guide the re-calibration of Digital Malta, so that it remains equipped to satisfy evolving needs.



Fig. 10

MEASURING DIGITAL MALTA

An open and participatory approach will be adopted when measuring success.



11.1 PERFORMANCE TARGETS

The following DAE targets are adopted for the Digital Malta Strategy:

Target	By
33% of SMEs selling online	2015
Fast broadband (>30 MBPS) coverage available for all	2020
50% of households taking up broadband subscriptions having >100 MBPS	2020
20% of population buying online across-borders	2015
50% of population buying online	2015
60% of disadvantaged people using Internet regularly	2015
75% of population using Internet regularly	2015
15% or less of the population have never used the Internet	2015
100% increase in ICT R&D Public Spending	2020
50% of population using eGovernment	2015
25% of population using eGovernment and returning forms	2015

Malta has already achieved the 'Broadband coverage for all by 2013' target.

11.2 PERFORMANCE INDICATORS

The success of the Strategy will be measured using three performance indicators:

- Existing benchmarking exercises carried out by reputable independent organisations.
- Qualitative evaluations, identifying the extent of implementation and benefits delivered to citizens, business and government.
- Assessments, surveys and audits analysing specific areas.

11.3 BENCHMARKING EXERCISES

Various international organisations carry out studies to measure and compare the performance of different countries. These measures will also be used by the Governing Body to gauge success:

Eurostat - Information Society Indicators

- Percentage of Individuals using the Internet for interaction with public authorities
- Percentage of Individuals using the Internet for interaction with public authorities, by type of interaction
- Percentage of enterprises using the Internet for interaction with public authorities
- PC and Internet penetration rates for business of different sizes
- Percentage of Enterprises having purchased online
- Percentage of Enterprises having received orders online
- Size of ICT workforce
- Contribution of ICT sector to GDP
- Contribution of ICT enabled sectors to GDP
- Total eCommerce export (or percentage of enterprises exporting through eCommerce)
- Total percentage of eCommerce trade within the local market

World Economic Forum - The Networked Readiness Index

- Environment index
- Readiness index
- Usage index
- Impact

United Nations - eGovernment Indices

- eGovernment development index
- Online Service index
- Telecommunication infrastructure index
- eParticipation index

European Commission - eGovernment benchmarking

- User-centric government
- Transparent government
- Citizen mobility
- Business mobility
- Key enablers
- Effective government
- eGovernment use

INSEAD & Singaporean Human Capital Institute - Global Talent Competitiveness Index

- Enablers
- Attract
- Grow
- Retain
- Labour and Vocational
- Global Knowledge

11.4 QUALITATIVE EVALUATIONS

In addition to quantitative measures, qualitative criteria will be used to assess whether or not:

- ICT has contributed towards improving the economic competitiveness of the country.
- ICT has brought sustained improvements in the quality of life of Maltese citizens.
- ICT has enabled sustainable economic growth in business.
- The Maltese public are constructively engaged in realising Digital Malta.
- Government is more efficient and more open.
- Areas of ICT skills shortages have been addressed.
- Malta has a sound legal basis and regulatory framework for digital growth.
- The Maltese ICT community has critical mass, access to resources and supporting infrastructure.

11.5 SPECIFIC ASSESSMENTS

The rhythm of achievement will be monitored by closely observing specific areas. This will be done through assessing:

- The readiness and use of ICT by local entrepreneurs to determine levels of access, skills, perceptions and technology foresight.
- The extent of use of ICT by SMEs in Malta.
- The supply chain level of automation by industry sectors.
- The readiness of logistics services.
- The entrepreneurial culture and ICT integration within local business.
- The readiness of Maltese enterprises to internationalise.
- The attributes of non-users, particularly in relation to access, affordability and perceived uses. Focus will be on working adults, the unemployed and the elderly.
- The use of ICT, perceptions and competence levels of the Maltese.
- The level of satisfaction of users of online government services.
- The National Cyber Security Strategy based on considerations issued by International Organisations e.g. the ENISA ¹⁸.
- The realisation of benefits and value for money audits.

¹⁸ ENISA, "National Cyber Security Strategies – ENISA" Report/Study, 2012.

