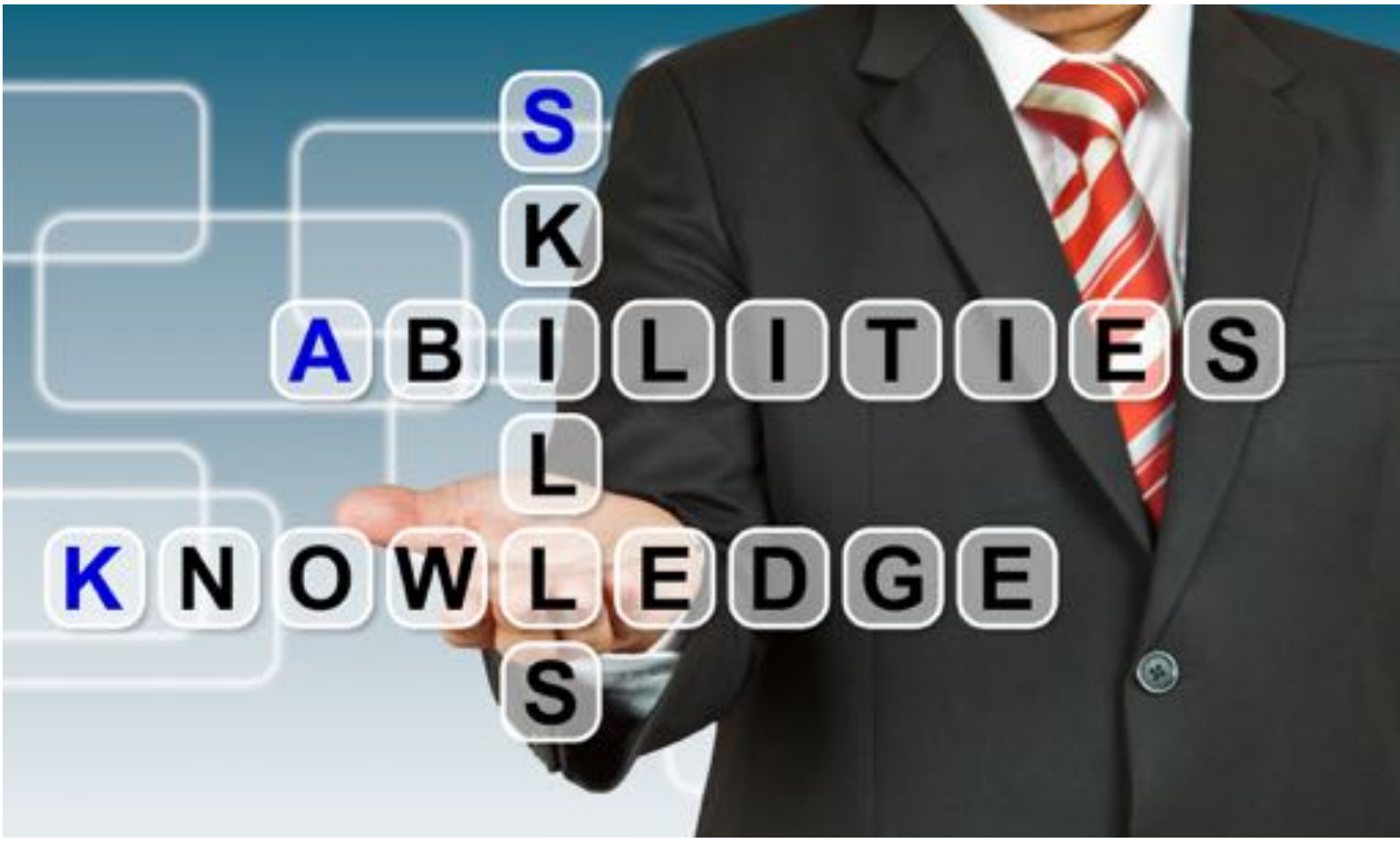
MALTA ICT SKILLS AUDIT 2017



Building Malta's Tech Talent Pipeline

eSkills Malta Foundation

The ICT Talent Pipeline

Acknowledgements

This Audit is a collaboration between eSkills Malta Foundation and FastTrack into Information Technology (FIT) Ltd. FIT is a non-profit, tech industry-led body, based in Ireland, whose core mission is to promote an inclusive Smart Economy by creating routes to marketable technical skills for job- seekers, particularly those at risk of long-term unemployment. eSkills Malta Foundation wishes to acknowledge the ability and professionalism of FIT, in particular Peter Davitt, Edel Hesnan and George Ryan, for the design and delivery of the ICT Skills Audit, the interpretation of the key findings, and for the collation of the significant recommendations presented in this report, for consideration.

We would also like to show our gratitude to the various companies and organisations in Malta who shared their views on their ICT skills, competences and education requirements, to serve as an input for the ICT Skills Audit. The non-exhaustive list includes the following leading companies.

PTL (Philip Toledo Ltd)
RS2 Software PLC
Megabyte Ltd
Exigy Ltd
EY (Malta)
Untangled Media
KPMG Crimsonwing
SITA
Toly Products (Toly Management Ltd)
Agilis Ltd
BMIT Ltd
Smart Technologies Ltd
PwC (Malta)
Netrefer
ICON Studios Ltd
Bit8 Ltd
Baxter Trading Company Ltd
ISL (Information Systems Ltd)
Computime Group
Tipico Co Ltd
Betsson Group
MITA (Malta Information Technology Agency)
IXARIS Systems Ltd
2i Ltd
Corinthia Group
BOV (Bank of Valletta PLC)
Vodafone (Malta)
Ascent Software

References

Ginni Rometty, IBM CEO, USA Toda entitled "For a career at IBM, you can skip the college education"

Professor Alisson Wolf, Financial Times 2016

James Dyson, Businessman

Maggie Stilwell, Managing Partner for Talent, Ernst and Young

Mark Jeffers, Software Engineering Manager, Accenture Ireland, Techcentral.ie, 23rd January 2017

Framework for Education Strategy for Malta 2014 – 2024

U.S. Department of Labor Report

Malta's Advantages as a Business and Financial Centre

Labour Force Survey Q2 2016

Labour Force Survey Q3 2016

Registered Unemployed November 2016

Gainfully Occupied Population June 2016

European Jobs and Skills April 2014

CEDEFOP Jobs Forecast 2020

CEDEFOP Apprentice Review Malta 2015

Remote Gaming in Malta 2015 Update

Digital Malta 2014 – 2020

Framework for Education Strategy Public Consultation on Education Strategy Malta 2014-2024

National Employee eSkills Survey Malta 2016

Malta National Employment Policy Document May 2014

Malta Employment Statistics

Schemes Available at Jobsplus

Malta Unemployment Statistics

Guidelines for Employment Licenses Unit October 2016

Malta Employability Index 2015

National Employee eSkills Survey Malta 2016

Labour Market and Wage Developments in Europe 2015

Employment and Social Developments in Europe 2015

Skills Qualifications and Jobs in the EU – The Making of a Perfect Match

Malta Skills Forecast 2015

Registered Unemployed October 2016

Gainfully Employed Malta May 2016

A National Curriculum Framework for All – 2012 Malta

Progress in International Reading LS 2011 Malta Report

School Leaving in Malta June 2014

A National Literacy Study 2014

Malta National Lifelong Learning Strategy

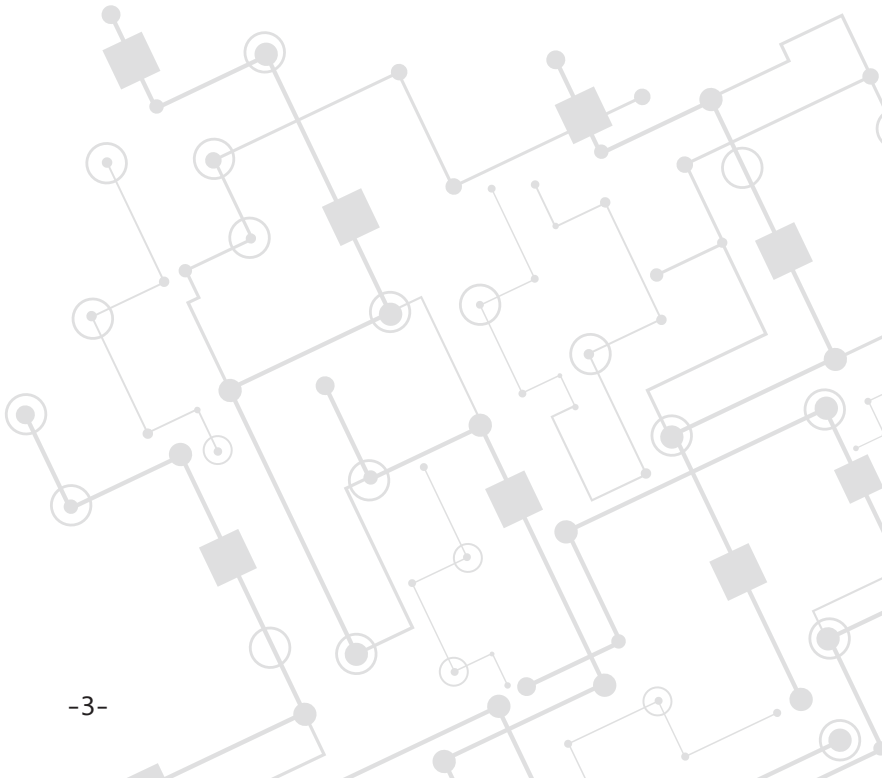
Special Needs and Inclusive Education in Malta – External Audit Report

Trans Gender Variants and Intersex Students in Schools Policy

Country Profiler Malta 2015

DESI Country Report

Malta National Youth Policy Toward 2020



CONTENTS

Foreword 6

Preface 8

Executive Overview 10

- Aims of the Report 11
- Summary Findings 11
- Key Considerations 13
- Recommendations 15

1. Introduction 18
2. Setting the Tech Skills Trajectory to Sustain Growth 23
3. Supply and Demand 28
4. Malta ICT Skills Audit Methodology 30
5. Data Analysis 33
6. Further Considerations 54
7. Concluding Remarks 58

APPENDIX 1

Malta ICT Skills Audit Questionnaire 60

Foreword

The ICT Skills Demand and Supply Monitor, or as it is also called the ICT Skills Audit, was one of the priorities in the plan for 2016. With the Foundation involved in many initiatives, I have to say that this was a challenge. We had to think well on who to engage on this study, and the approach, since some of the information needed was either confidential or involving a strong opinion. In the end, we found the right partner to help us through, and the collaboration of most of the industry. eSkills Malta Foundation sought the expertise of FastTrack into Information Technology (FIT) for the development and analysis of the ICT Skills Audit, seeking to capitalise upon its extensive experience in this area.

We wanted the study as effective as possible, targeting specific needs of the industry, and not some shelved study. When we initiated the project, from the first meeting, it was clear that although we needed to delve deep into the requirements, we also had to look at the holistic picture. Therefore, this exercise attempts to bring an in-depth analysis, and employer sentiment, to debate and enrich the insight of first-rate education and training providers. This would serve in meeting the current and future skills developments of the Maltese population.

Make no mistake, we have a very good local education. Many stakeholders are doing their best, but it is very clear that Malta has the same problems that are being experienced all over Europe, namely,

a. that we need many more ICT practitioners, and professionals, than are currently being churned out by education providers, and

b. there is still a mismatch, and a gap, between the education and the industry requirements.

In Malta, this is even compounded with the booming Gaming and betting industry that has heavily disrupted the requirements on the ICT industry providers.

eSkills Malta Foundation initiated this Skills Audit to shine a light on an opportunity, namely a career in IT, which if not catered for adequately, could become problematic, and cause a slow-down on the Maltese industry growth and prosperity. The future is within grasp to seize through tech skills development initiates, the widening of the Maltese tech talent pipeline, promoting new employment opportunities and upskilling, and to complement existing with new approaches, to broaden and expand the skill base.

In the midst of this fast-changing technology, busy industry, and urgent requirements, we need to step aside, and take a hard look at what we are doing, what other countries are doing, and to collaborate in this journey to minimise the loss of opportunities that the tech industry will be facing.

This document draws out the key findings of the study, recommendations and considerations, and it presents an opportunity for various stakeholders to consider well their current and future plans. Only in this way we will grow to be amongst the leaders in Europe.



Carm Cachia
Executive Coordinator

Preface

eSkills Malta Foundation

The eSkills Malta Foundation was launched by the Government, in February, 2014, as 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.

The general aim of the Foundation is 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.

The official mandates of the eSkills Malta Foundation entrusted to the Foundation include:

- to advise Government and stakeholders on matters related to eSkills policy;
- to contribute to the expansion of ICT educational programmes and related formative initiatives;
- to lead an ICT professionalism development programme;
- to instigate further reform in the ICT educational offerings, and contribute to capacity-building in the ICT education community; and
- to champion campaigns and promote the Maltese eSkills potential locally, and internationally.

The Foundation collaborates with various local and foreign institutions and organisations to share, and make use of, best practices in digital skills initiatives. It has been the national contact point (NCP) for the eSkills4Jobs campaign, and now also for the Digital Skills and Jobs Coalition, launched in December, 2016.

FIT (FastTrack in IT)

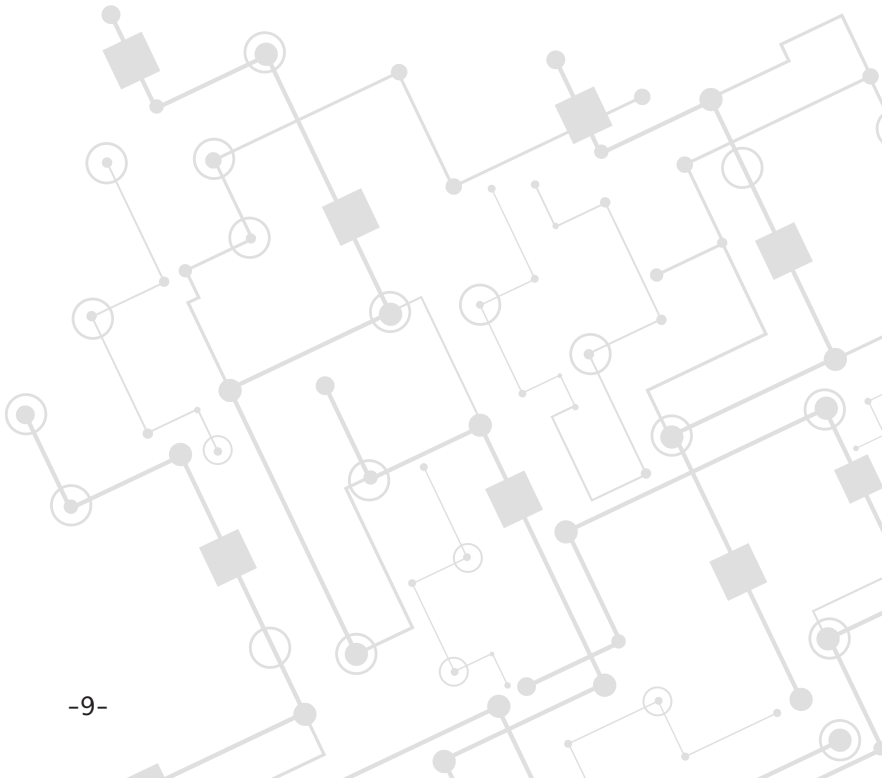
FIT (FastTrack in IT) is an industry-led initiative which works in close collaboration with Government departments, national education, training agencies, and local development organisations. A registered charity and non-profit organisation, it established in Ireland, in

1999. Its Board is comprised of representatives of major multi-national corporations and indigenous companies, including: Accenture, AOL, AQMetrics, CISCO, Ebay, eDot, EMC, Fujitsu, IBM, Kantan MT, LinkedIn, Microsoft, Novartis, Openet, SAP, Siemens, Sisk Healthcare, Skillsoft and Vesta.

FIT's mission is to 'promote an inclusive Smart Economy by creating a fast track to marketable technical skills for those at risk of long-term unemployment'.

It is the primary industry skills development initiative facilitating collaboration with Government, education and training providers, and disadvantaged communities, to enable greater access to employment for marginalised job-seekers. The Initiative develops and promotes technology-based programmes, and career development opportunities, for job-seekers who have become detached from the labour market in an increasingly knowledge-based economy.

To date, over 18,000 job-seekers have completed FIT skills development programmes of which more than 13,500 progressed into employment. 4,000 job-seekers are currently participating in FIT programmes. Recently, the EU Commission cited FIT as one of the most effective employability initiatives in Europe.



Executive Overview

The Maltese economy has been one of the best performing economies in the Eurozone, demonstrating steady economic growth and high employment, bolstered by a growing service-based economy which generates more than 70% of GDP.

The Maltese Government, committed to developing Malta as a high-income economy, has invested heavily in the ICT sector as a platform for inward investment. In recent years, the services industry expanded to higher value added activities generated by the financial services sector, professional services, back-office administration, information technology etc. Information Technology (including Gaming), from a modest beginning, is the second largest contributor to the country's GDP, with exports growing from €46 million, in 2004, to over €200 million, in 2015.

As a small open economy, it is imperative that Malta keeps pace with global economic and industrial development priorities, and best practice. Failure to do so may jeopardise growth prospects, and deprive citizens of the capacity to develop the skills, and talents, to ensure strong career prospects and sustainable employment opportunities. Despite political and economic volatilities in Europe, the US, and more generally globally, Malta's economic outlook is positive. Indeed, volatilities such as Brexit, can possibly offer more opportunity, than threat, to an English-speaking economy, such as Malta, with its close proximity to European and North African markets, as well as its global reach.

Worldwide, a key characteristic of progressive economies is the increasing demand for highly skilled and professional workers, who add value and increase productivity to capital. In the EU, generally, greater emphasis is placed on expanding Higher Education as the principal way of ensuring that the skills need of the economy are met. There has been much less emphasis, until recently, on the contribution of Further Education, and training, and the extent to which firms utilise the application of the skills, knowledge and competencies of their employees in the workplace. In order to compete globally, Malta should ensure incorporation of all three aspects within tech skills development programmes, and should adapt necessary strategies and actions for the effective incorporation of same. In addition, a more defined and integrated continuum of tertiary education provision, encompassing Further Education (FE) and Higher Education (HE), needs to be systematically determined, strategically coordinated and appropriately resourced.

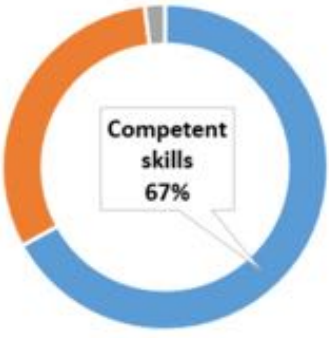
The Aims of this Report are:

i. To present a concise picture of what specific tech-skills are in demand in Malta in the immediate future, to 2020;
ii. To present granular analysis of the relative demand at different levels of expertise across key disciplines in the tech and related sectors;
iii. To provide Malta's ICT sector with a coherent and valid overview of emerging priorities;
iv. To give insight on the employability skills, professional development, and transferable skills that concern employers;
v. To further inform prospective ICT practitioners, whether they be young, currently unemployed, those considering a career change, immigrants, or entrepreneurs seeking to start a new business;
vi. To assist the education and training sector in the development, and scheduling, of ICT programmes across the continuum of Further and Higher Education, and training provision, as well as guiding their potential participants;
vii. To inform national and regional development agencies, and to assist them in creating their skills development and growth strategies for tech related sectors;
viii. To assist policy makers in developing suitable policy responses, identifying priorities and putting in place effective funding strategies;
ix. To facilitate industry collaboration and participation in addressing skills priorities to support future growth and prosperity within the Maltese economy.

Summary Findings

In total, 40 tech companies participated in the Skills Audit, ranging from SMEs, to major multi-nationals in ICT and tech related sectors. The following Survey findings are based on in-depth face-to-face interviews with managers, technicians and HR/Recruitment Specialists. The survey sample is deemed significantly representative of employees in the sector.

Industry Demand



Clear, Well Defined, continuum Provision



- Findings, combined with in-depth desk research and discussion with recruitment specialists, indicate that there is in the region of 600 current vacancies in ICT and tech related sectors in Malta, and the skills shortage is not a constant, but escalating.
- 67% of demand is for entry and competent level skill-sets, with 31% requiring expert competencies.
- Much of the demand could be addressed through discipline, defined technology skills development programmes, ranging from 6 months to 24 months' duration, from Level 3 upwards on the Malta Qualifications Framework (MQF).
- 53% of respondents intimated that a clear, well defined, continuum of provision embracing both Further Education and Training and Higher Education would be beneficial.

Confidence in fiding required Staff



New Recruitement by Employers Next 18 Months



- The desire for industry certification to complement national awards in the form of 'blended' certification is of note.
- The range and level of course provision should mirror skills demands in the sector, and there is scope to complement current provision with dual education and upskilling initiatives.
- While 75% of respondents anticipated new hires over the next year to 18 months - over 66% expressed concern in terms of accessibility to suitably qualified candidates anticipating unfilled positions.
- There was an overwhelming consensus that the current tech talent pipeline in Malta is a depleting resource, resulting in escalating skills shortages in tech related sectors, and as a result, impeding business development.

- The majority of respondents expressed visceral frustration with current time consumption and delay in filling vacancies.
- Over two thirds of respondents intimated that a significant proportion of Maltese candidates/recruits displayed deficiencies in soft skills/employability skills and professional development. Concern was also expressed with regard to candidate's English (language) oral and written competencies, as required in a business setting.
- Companies are keen for recruits to display problem solving skills and strong work ethics.
- Skill shortages fuel a continuous escalation of unfilled vacancies and an increase of over-reliance on the attraction and retention of foreign nationals.
- In addition, technology skills respondents indicated a strong demand for candidates with competent skills in administration, sales, and project management.
- Access to technically competent candidates, proficient in international languages, is a continuous challenge.

Key Considerations

- The growth potential of the tech sector in Malta is being jeopardised at a time when other European economies are experiencing the first shoots of growth after a decade of economic stagnation
- Disciplines noted with significant vacancy levels include:

1. Programming/Development Methodologies
2. Mobile Technology/Development Platform
3. Web Development/Technologies
4. Software Development Tools & Methodologies
5. Cloud Computing
6. Platform Administration
7. DevOps
8. Networking Technologies
9. Big Data
10. Enterprise Applications
11. E-Business/Digital Marketing
12. Call Centre/Contact Centre Support
13. Digital Skills Media
14. Games Development
15. Project Management

*Within the occupational areas outlined, over 250 key skill-set requirements were analysed.

- In the light of rapid and ubiquitous advancements in IoT technologies, 62% of respondents expressed a desire for greater diversity in the range, and type, of skills training provision and increased volume from MQF Level 3 upwards.

- There is a growing acceptance amongst employers of the need to innovate, encourage and engage candidates beyond existing traditional recruitment streams, and a desire to actively collaborate in the development of additional interventions to broaden the tech talent pipeline.

- A more expansive range of tech disciplines should be coordinated and catered for across the continuum of Further and Higher Education. Particular interest was expressed in the development and expansion of upskilling interventions and dual education initiatives ('learn and earn') as a means of addressing the most pressing shortages in a timely fashion.

- Broad consensus that the concept of 'skills for the economy' should be a key tenet of Malta's Education Strategy 2024. Absence of innovation and judicious intervention in addressing skills demand, could result in curtailment of significant growth potential in Malta – at a time when economies are grappling with political and economic volatility within Europe, as well as globally.

- 84% of respondents expressed strong endorsement for the advancement of skills development strategies that would elevate the nations Human Capital as a whole, and increase access to quality employment and enhanced career prospects. Initiatives, in this regard, that support increased female participation in the workforce are particularly welcome and to be encouraged.

- 73% of respondents expressed a desire for additional initiatives and incentives to be enacted to attract foreign talent, as a complement to national workforce development, purporting that Malta should be showcased as a long-term career opportunity, and not as a 'sabbatical in sunny climes'.

- Current shortages need to be addressed forthwith, and decisively, to meet corporate business imperatives while providing opportunities for the many job-seekers with the acumen to work within the broad range of varied roles, and disciplines, across the sector.

- Additional Initiatives should be considered at Second Level to highlight the diversity of career opportunities within ICT, and tech related sectors in Malta, and the prospects with regard to the quality of employment, income capacity, and career advancement opportunities.

- While demand, in the technology and associated knowledge-intensive exporting sectors, will continue to attract third level qualifications, the 'human capital' requirements of these sectors, as evidenced in the Skills Audit, are significantly broader. These provide employment opportunities for people with a range of technical, as well as general skills, which can be facilitated more comprehensively across a strategic continuum of Further and Higher Education and Training provision. Many of the roles, and skills sets in demand, lend themselves to vocational forms of study.

- Accordingly, added focus should be given to strengthening vocational training, and applied learning styles of provision, and to promoting its attributes to learners, while encouraging employers to avail of the quality skills provided.

- It would be imprudent for policymakers, and industry, to rely predominantly on increasing the number of Higher Education graduates in the workforce to supply the skills that the economy needs immediately, and those it will require into the future.

- The courses and qualifications taken by young people, and job-seekers, across the continuum of tertiary education, that is Further Education and Higher Education provision, need to better match the skill disciplines of employers alongside learners' needs for subsequent employment. Therefore, these must address theory and application in equal measure, as well as imparting transferable and employability skills.

- The Audit's findings underline the urgency of proceeding decisively, and promptly, with reform programmes. It requires the prioritisation of measures that can have the most immediate impact in facilitating employers to generate employment opportunities. Also, in assisting young people, and job-seekers generally, to acquire the necessary and appropriate skill sets to fill them.

Recommendations

Eight key recommendations are presented for consideration in an effort to facilitate necessary dialogue, and expedite solutions, amongst key stakeholders.

I. **Upgrade the eSkills of the Maltese workforce to address the tech skills deficit - in line with the current employment policy.** In this regard, collaborative research, and constant dialogue with employers on the skills agenda, need to be more strategic, systematic and granular. Also, to inform and encompass what both Further Education and Higher Education is capable of supplying, in a strategic, and coordinated continuum of education and training provision. Such engagement needs to be prioritised, actioned and institutionalised. The majority of respondents cited lack of opportunity and structure for co-operation with policy makers, and education and training providers, as an impediment to effective engagement.

   A key outcome should be the development of an enhanced portfolio of tech programmes on offer, responsive to the immediate and emerging skills needs of industry, incorporating new training interventions, where appropriate. The use of massive open online courses (MOOCs), and e-learning, could be considered to support these initiatives. "Techcelerator" or bootcamp type of skills development interventions could also be considered to offer focused training to address urgently the required tech-skills.

II. **Consideration should be given to increasing the type and range of tech training provision** including enhancements in the areas of dual-education initiatives (learn and earn options), work-based learning and work experience/traineeship initiatives as a complement to current provision in addressing the application of skills and competencies in the tech and related sectors.

A broader and more varied portfolio of provision would ensure greater complementarity and relevance between skills training, employment opportunities, and would encourage greater diversity in the Maltese tech skills arena to support future growth. In addition to national certification, industry based training and certification (IBTC) should be acknowledged as a valued component within the tech training ecosystem, which is held in high regard by many employers.

The portfolio of ICT provision should be systematically revised, and where necessary, revamped, on a bi-annual basis. Digital Inclusion Initiatives should be supported to encourage foundational tech skills development 'up-stream' in the labour force.

III. **Ensure ICT course curricula fulfil learner's career ambitions and employer skills needs.** Core to all tertiary programmes, across Further Education and Higher Education, must be in regard for the needs and aspirations of learners to secure quality employment (not just any job) as well as satisfying the varied requirements of the industry. To this end, education and training programmes should be adjudicated on the basis of their capacity to equip job-seekers with the necessary skills, and acumen, to compete successfully in the labour market, within career paths, deemed complementary to the discipline studied.

IV. **New entrants to the labour market need to be socially, professionally, as well as technically equipped for the transition from school to work.** To this end, imparting employability skills, professional development and transferable skills are as important as technical acumen. Access to accredited competence-based training programmes, responsive to current labour market demands, can effectively facilitate the transition to work.

V. **Remedial action is required to progress vulnerable job-seekers, and disadvantaged persons, and in so doing, address the incidence of structural unemployment and to facilitate greater social cohesion.** The extent of early school leaving results in a relatively high incidence of poor literacy, numeracy, science and digital skills, combined with the significant numbers of young people who are not in education, or employment or training (NEET's), is of concern with regard to the welfare of these individuals, and for the loss of their potential to the Maltese economy. Labour market activation initiatives should be supported, particularly in the context that the economy enjoys almost full employment, and strong labour demand, for the foreseeable future. This will thereby provide a real opportunity to address the incidence of structural unemployment/disadvantage, and to facilitate greater social cohesion

VI. **Second Level students should have adequate access to career guidance professionals who are 'au fait' with the requirements, and varied demands, of tech related employers.** The tech sector experiences rapid change, as a constant, as new technologies replace old. This creates new products and processes, increasing efficiencies, while new roles and functions not envisaged in the recent past come to the fore. Access to appropriate skills inventories, aptitude assessments and guidance information on the range of educational pathways (including dual education options), is vital to ensure students discern the best learning route to realise their aspirations - informed by anticipated growth sectors in the Maltese economy which provide quality employment with strong career prospects.

VII. **Non-traditional recruitment streams should be enabled to pursue ICT careers through the provision of upskilling and reskilling opportunities** - facilitating greater diversity in the workforce while promoting social cohesion. The success of recent initiatives to encourage female participation in the workforce should be built upon. Particular initiatives to increase participation of 'women in technology' should be considered with the support of industry.

In promoting diversity, the range, type and flexibility of programmes, need to be considered. This is to ensure a broader representation of the Maltese workforce in the tech sector, and to ensure recognition of their potential contribution in complementing the necessary supply of ICT practitioners in the labour market, necessary to keep pace with the rising demand.

VIII. **An industry-led Forum should be established to facilitate, and give oversight, to the sector's contribution in the development of a 'fit for purpose' technical skills development strategy** - that can support the delivery of the necessary talent pipeline, to maximise job creation and employment growth, from the inherent potential within the Maltese tech sector in the period, to 2020. The forum should adopt a terms of reference, set key performance indicators, meet quarterly and operate in close collaboration with policy makers, education and training providers, and the community at large. eSkills Malta Foundation could facilitate the coming together of relevant stakeholders, from industry with Government agencies and education and training providers, to determine the most appropriate vehicle for collaboration to achieve the desired outcomes in a timely manner.

1. Introduction

The Maltese economy has enjoyed strong economic growth in recent years - 2015 witnessed 6.4% growth, and 2016 is estimated to come in around 5.2%. In the past two years alone, Eurostat data suggests unemployment fell from 5.85% to 4%, and more significantly, youth unemployment fell from 11.8% to 6.9% - lowest amongst the EU 28.

Labour Force Survey statistics, for Quarter 3: 2016, indicate that total employment in Malta was 193,893, accounting for more than 50% of the population aged 15+; unemployed totalled 9,870 (2.7%); while inactive persons amounted to 161,744 (44.3%). Of note, in the findings, while 67 out of every 100 persons aged 15 - 64 years were employed, the male employment rate was 79%, whereas the female rate was just 53.6%, which is significantly lower that the EU28 average where the female participation rate suggests persistence of the prerequisites of the male breadwinner model. By the same token, there indicates scope for improvement, and the potential for increased female participation in the labour market. Similarly, the unemployed, in general, must be valued as an untapped resource, full of potential, and deserving of the opportunity to secure quality employment that provides good income, and strong and sustainable career prospects.

Malta's economic growth has been assisted by the transition from a dependence on manufacturing, towards a service economy, and the creation of industry sectors reliant on higher value-added economic activity. As a consequence, educational attainment and skills development must be at the forefront of the socio-economic policy. This is in order to achieve shared prosperity and sustained social cohesion. Education and training improves quality of employment on offer, broadens the range opportunities, and increases higher earning capacity, thereby reducing the risk of poverty among job-seekers.

Increased productivity strengthens competitiveness and facilitates the raising of living standards in an economy such as Malta's. Improving the skills base must be the Nations priority to mitigate the incidence of poverty, and to ensure greater social cohesion, and thereby, is an imperative cornerstone of all future policies to ensure a sustainable and prosperous economy into the future.

Experiencing close to full-employment, Malta's future prosperity is reliant upon further transitioning to higher-value economic activity. To this end, the reskilling and upskilling of various cohorts of the current workforce, as well as enabling and engaging the unemployed,

particularly those on the margins. In this regard Malta's situation is unique from other EU Member States who are still coping with significant levels of unemployment, and in particular, youth employment.

Malta, contending with a tightening labour market and significant skills mismatch in a period of strong growth, has however, no less a challenge. If not addressed, it could abruptly impose a ceiling to the economic capacity of the islands.

Creating the Future

Currently, more than 50% of Malta's job opportunities in tech-related sectors are reliant upon the skills and competencies of foreign workers. While a multicultural environment brings a richness and diversity in skills and attitudes, such over-reliance on immigration to fuel growth in the tech sector brings vulnerability and high-dependence. Development of the nation's human capital and maximisation of employment opportunity will ensure shared prosperity for citizens and future generations. Ensuring that new entrants to the labour market acquire the necessary skills and essential work ethics is imperative for sustained growth and shared prosperity.

This ICT Skills Audit was carried out in the last quarter of 2016, at a time of particularly strong expansion in ICT and related sectors. As outlined, the Audit estimates that the skills mismatch is not a constant, but is growing in scale. It conservatively estimates that there are in the region of 600 current vacancies, across a range of disciplines, requiring an array of technical skills sets and professional attributes. It also suggests that additional job growth potential in the sector, more than 4,000 new positions is achievable by 2020, subject to access the suitable skills. The skills in demand span the MQF Level 3 upwards, however, it should be noted that the largest share of vacancies do not necessarily require a higher certification, but are within reach of a broader range, encompassing Further Education provision (6 to 24 months' duration), subject to relevant technology programmes being offered.

These findings are not unique to Malta. A similar audit in Ireland, in autumn, 2014, identified 7,000 current vacancies, of which 75% could be filled through appropriately developed technology programmes, a Level 5 and Level 6 on the Irish Framework of Qualifications (MQF Level 3 and Level 4). These findings, in part, resulted in the introduction of a new dual-education initiative, called ICT Associate Professional (ICTAP), which since its introduction in May, 2015, has seen over 120 technology companies (large multi-nationals and indigenous companies) sponsor more than 200 candidates to date, and is expected to rise to 500 participants by the end of 2017, with a goal of 5,000 beneficiaries by 2020.

Fact Influencing Policy

It is interesting to note that industry leaders and policy makers are also advocating support for the concept of vocational training as a credible currency, and a valuable complement to

Higher Education, with regard to fuelling the skill needs and demands of the tech sector. In December, 2016, IBM CEO, Ginni Rometty, in an open letter to president-elect Trump and in a column written for USA Today entitled: 'For a career at IBM, you can skip the college education', emphasised that many IBM jobs don't need degrees, but belong to a novel class of "new collar" employment. They're "entirely new roles in areas such as cybersecurity, data science, artificial intelligence and cognitive business,"

Likewise, the issue of access to technical skills is beginning to resonate in the minds of UK policy makers as Brexit looms, and future productivity in a global market comes into focus. As recently reported in the FT (Financial Times), Professor Alison Wolf launched a report on Higher Education, in November, 2016. She implied that a profound mistake was made in promoting an explosion of academic degrees, and a collapse in skills training. Similarly, Brexit-backing businessman, Sir James Dyson, has emphasised the importance of technical education to the UK's economic health as it leaves the EU. He cautions that the lowly status of vocational training, in Britain, leads to poor participation at advanced technician levels leading to escalating skills gaps, recognised as a reason in low productivity.

Increasingly, 'the penny is dropping' with companies as a broader appreciation of the skills ecology of industries is beginning to come to the fore. In 2016, major employers like Ernst and Young, PricewaterhouseCoopers, Deloitte and Penguin Random House, decided to drop the degree criteria as an eligibility requirement for job applicants. Ernst and Young, Managing Partner for Talent, Maggie Stilwell, said the new recruiting strategy would "open up opportunities for talented individuals, regardless of their background, and provide greater access to the profession". This desire for technical competencies is being replicated among many smaller companies, as more and more employers express increasing concern that many students are coming out of third level programmes academically sound, but lacking the know-how, or appreciation, of the application of skills in the workplace.

In Australia, the currency of vocational education and work-based learning has been consistently increasing over the past decade, both with Further, and Higher Education provision. Transferable and employability skills, such as personal and professional development, flexibility and adaptability, work ethic and project management skills, reliability and time management, are being increasingly valued along with the application of the necessary technical skills at entry, competent, and expert levels.

CASE STUDY

A different path!

The search for talent is prompting changes in hiring practices.

The 'War for Talent' is a well-worn cliché but like most clichés is true, and never more so than in the technology sector in Dublin today.

As the world becomes increasingly digital, the pool of employers hiring people with technology skills has widened beyond the well-known technology companies to other industries, and the public sector. As with so much else in this brave new world, relying on the traditional recruitment channels is no longer enough.

It is against this backdrop that we began working with FIT (Fast-track into IT) on its ICT Associate Professional (FIT ICTAP) dual education programme, which aims to attract job seekers from different backgrounds into appropriate roles in the technology and communications sectors – to create lasting solutions aimed at closing employment gaps.

FIT developed the ICTAP programme following a skills audit of jobs in the ICT sector in 2014 which showed that 75% of technology industry companies need to fill competent and entry-level roles. As a result of a successful pilot of ICTAP, currently over 100 tech companies are sponsoring over 220 candidates on the programme. The two-year programme combines college-based learning with work-based training. The first six months involves training, followed by 12 months working for three days a week at a designated company's office with two days' college work. For the final six months of the course, participants work a four-day week and spend one day a week in college.

The programme specialises in two fields: Software Development and Network Engineering. Accenture initially sponsored 5 software development apprentices during the pilot phase proposes to sponsor a further 20 candidates during 2017. What has become very clear to us is that this is a viable alternative route to getting good people. The programme has people with good skillsets but who would not necessarily fall into the graduate category and so FIT is helping us effectively broaden our capacity to access top talent.

We are getting very good people who are reskilling in technology and are looking to take a different career path. We have found that the ICTAP interns have a level of maturity when they come in having possibly spent some years working in other industries. What is evident is that they bring a different way of thinking because they have that experience. This is incredibly valuable for Accenture which prides itself on the diversity of its people as we seek to innovate for our clients.

The competition for technology talent is well documented and it is refreshing to know that an organisation like FIT has spotted an opportunity in the employment market place to fill the gaps that traditional recruiting methods do not meet. Not only has it spotted that gap and put very talented candidates onto its ICTAP programme, but its approach to working with employers is second to none. Accenture's experience with the FIT ICTAP programme has been overwhelmingly positive to date and we look forward to building on our relationship with FIT into the future.

(Mark Jeffers, Software Engineering Manager, Accenture Ireland). Dublin 23 January 2017.

TechCentral.ie

Time is of the Essence

In highlighting vacancies that employers find hard to fill, as a result of insufficient candidates with the right skill sets and cognisance that educational and training reforms, necessitate substantive lead-in time before employers, learners and job-seekers, enjoy their full benefits suggests that timing is critical. The Audit's findings underline the urgency of proceeding decisively, and promptly, with reform programmes and requires the prioritisation of measures that can have the most immediate impact in facilitating employers to generate employment opportunities. Also, in assisting Maltese young people and job-seekers to acquire the appropriate skill sets to fill them.

The findings of the audit suggest there is scope to carry out measures that would lead to an increased supply of indigenous talent to the ICT sector within a relatively short space of time, if there is a shared consensus and willingness to collaborate among employers, training provision, policy makers and the wider community.

The findings of the Audit, therefore, endorse the ambition set out in the Framework for the Education Strategy for Malta 2014 – 2024 – that tertiary education providers (Further Education and Higher Education collectively) should capitalise on the growth and employment potential in the thriving sectors of the economy, both to enhance their educational offerings and to make sure the skills requirements vital to the economy's health are met quickly. By doing so, they will equip more enterprises to remain competitive, create valuable jobs, and accrue additional income to the exchequer to fulfil Malta's policy priorities and the national interest. Actions and strategies adopted need to be responsive, flexible, ongoing, inclusive and timely to deliver long-term growth, increased productivity and competitiveness. These characteristics should not be just inherent in vocational training within FE, but equally should be seen as essential components within Higher Education in the delivery of advanced technician levels, so blending academic prowess with technical knowhow and effective application.

2. Setting the Tech-Skills Trajectory to Sustain Growth

By 2020, it is anticipated that over a third of all EU jobs will require competent skills combined with the ability to innovate and adapt to new contexts. The 'winners' in securing economic growth, prosperity and social cohesion, will be those countries who demonstrate the ability and determination to deliver demand-led qualitative skills development pathways that encapsulate traditional and non-traditional recruitment streams, and are of relevance and of high quality.

Today, Malta enjoys growth rates and employment levels which are the envy of many countries across Europe. Current industrial policy seeks to encourage and attract foreign direct investment while supporting growth in indigenous companies. High value-added, capital-intensive, and high technology industries are viewed as key contributors to future growth in the economy. The challenge for Malta is the advancement of industry segmentation to ensure increased value added productivity and continued growth in the midst of an ever-tightening labour market.

Emerging technologies continue to shape the skills needs of knowledge intensive industries. Just when concepts such as 'Cloud Computing' and 'Big Data' become familiar, new drivers of change such as the 'Internet of Things' (IoT), 'Artificial Intelligence' (AI) and 'Virtual Reality' (VR) come to the fore which are already shaping future products, market demands, and productivity. Accordingly, it is envisaged that this ICT Skills Audit would inform those responsible for delivering skills with regard to 'in-demand' and emerging technologies, and in particular on the capacity and requirements to be catered for to support growth and similarly to ascertain what's obsolete or redundant. Accordingly, the Audit is also intended to be a resource to policy makers, assisting prioritisation of actions and the effective and cost-efficient use of available funding, while providing guidance to students, job-seekers, parents and career guidance professionals on emerging tech career paths offering quality employment and future prospects.

New entrants and young people need to be informed and appropriately equipped in terms of skills, knowledge, competencies, fermented with the necessary attitudinal traits and work ethic to compete effectively for present and future jobs in the tech and related sectors. They

also need to acquire necessary transferable skills to avoid skill obsolescence as technologies and industry sectors continue to evolve. Of particular note in the Maltese context in this regard is the necessity to address the current high levels of children with low literacy, numeracy, science and digital skills, and early school-leaving rates which are some of the highest among Member States.

This document strives to build and encourage more effective synergies between education, the economy, and society. It endorses the active participation of employer's educators, parents and social partners, policy-makers in Government and non-Governmental organisations responsive to industry demand and emerging employment opportunities.

Digital Evolution

Tech-related sectors contend with a complex, and constantly evolving skills eco-system, highly dependent on osmosis and adaptation of technological advancements, to excel productivity and competitiveness. Technology trends combine evolutionary and revolutionary changes. Advancements constantly redefine and hone the skills that are in demand within specific enterprises and formulate new jobs opportunities and shape future career paths. In advanced economies, ICT innovations profoundly impact lives, enterprises, and the wealth and wellbeing of nations.

According to a recent U.S. Department of Labor Report, 65% of today's schoolchildren will be employed in jobs that have yet to be created. By implication, many current employees will need to give consideration to life-long learning and incremental strategies in order to consider the emergence of new roles and required skill sets necessary to make a living in 10 and 20 years from now. Rapid technological change is changing the skill demands for most jobs. Just as manufacturing embraced technological advancements and created new opportunities requiring different skills sets and disciplines, the coming decades will see more jobs avail of technological innovations and new career options previously unknown, will come to the fore.

The methodology adopted for analysing the sector's skills requirements attempts, in some small way, to encapsulate this complexity, while providing a high-definition snapshot of skill-sets current and emerging which are in short supply, and show up in hard-to-fill vacancies. Our digital world is forged in four fundamental paradigm shifts all premised on the invention of the internet as an 'underpinning technology'. Prior to, earlier technologies such as software programming, computers and networks, among others, provided the footings for the emergence of the internet.

Today, technological advancement can be revolutionary in their scale and impact, while being quite evolutionary in their underpinning technologies. Cloud Technology moved computing and storage resources to hugely scaled-up centralised off-site locations. The critical innovation

was the fusion of the internet, broadband with global mobile connectivity enabling immediate access and volume 'cloud' storage at nominal cost, resulting in the virtualisation of bespoke client services and infrastructure.



Figure 1

As a result, today, mobile purchases and real-time access to data and services, probably best demonstrated by the rampant use of technology platforms such as Ebay, LinkedIn, Facebook, Netflix, Spotify, iGaming etc., for virtual access to markets and media and in keeping us in immediate contact with our peers. Business has been transformed with real-time global access to markets, clients, and data.

The rise of social media and social networking has affected the way that people think about and interact with clients, friends, acquaintances, and even strangers. The new paradigm is that as people create social networks in technology spaces, which are bigger and more diverse than in the past, and which are accessible all-time from anywhere and thereby persistent and pervasive in ways previously unimaginable. So, blurring traditional boundaries between private and public, between home and work, between being a consumer of information and producer of it.

Internet of Things (IoT) is the current, and probably the most revolutionary and ubiquitous wave in the digital revolution, encapsulating internet-enabled technologies and enabling technological advancements towards 'connected' apparel, such as driverless cars, smartwatches and other wearables, smartphones/TVs, artificial intelligence/robots, the emergence of new medical practices, the construction of intelligent buildings etc., necessitating all the vertical applications, professional services, analytics incorporated. The assignment of IP, within embedded sensor nodes, make previously inert physical objects smart and interactive, with the capacity to continuously share data. As a result, billions of such objects will have the capacity to connect and communicate via the internet, generating enormous volume on consumer (people and businesses) behaviour, priorities and preferences. The data generated on an unprecedented scale may face peculiar security issues, which may not be

possible to address with the existing security mechanisms. The data may quickly become highly redundant, and may require highly efficient data analysis tools to extract the useful data. IoT will be the most transformative influence on humanity and how we interact with each other, the infrastructure, and the world around us. In the imminent IoT world, anything that can be connected, will be connected.

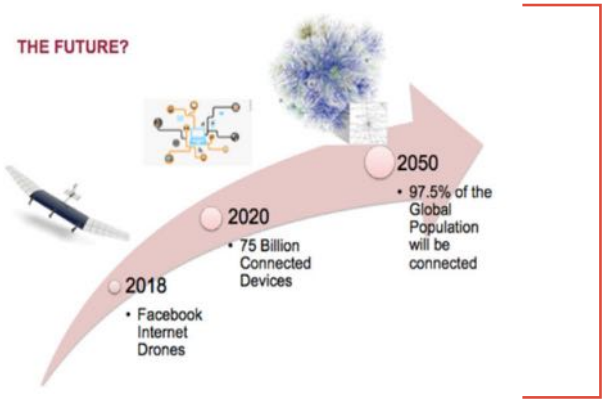


Figure 2

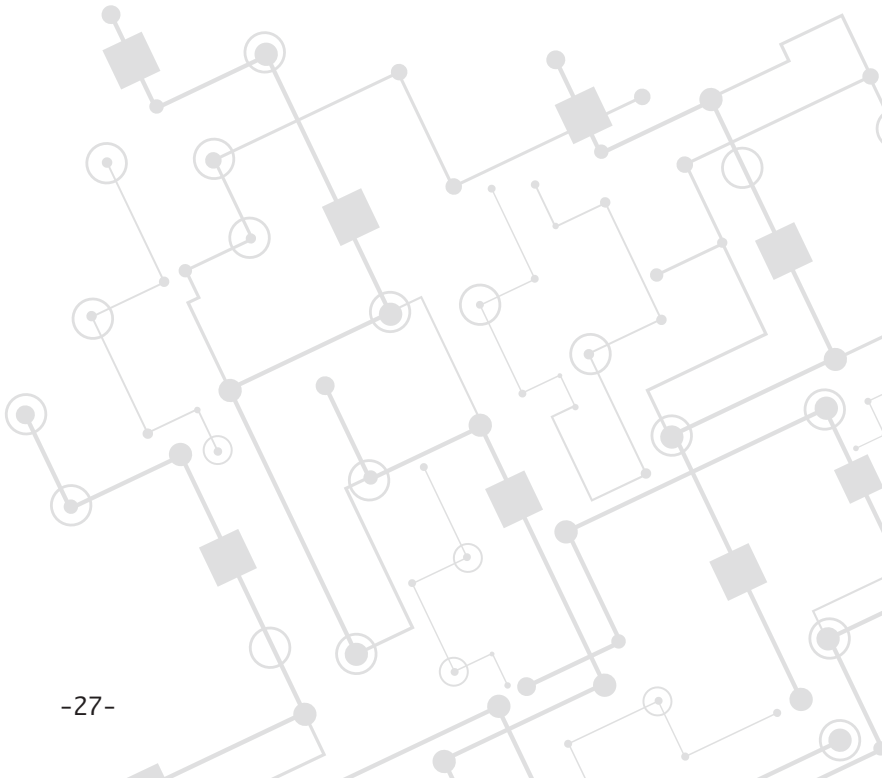
At the most basic level, IoT will promote devices and sensors that are connected to the internet, to provide users with smarter and more efficient experiences, and continuous data flows. Things, like being able to turn on the heating at home from your phone, accessing your work computer from the comfort of the settee, virtual monitoring of health and well-being, education using virtual reality, support service using artificial intelligence (AI) will become second nature. Key commercial uses for IoT perceived include healthcare, entertainment, energy consumption an environmental protection.

IoT is also having a fundamental impact on the marketing world arising from the new data, being gathered and analysed by smart devices, providing greater understanding of customer habits, preferences and priorities - where, when, and how products are being used by existing and potential customers. Gartner, Inc. estimates that 6.4 billion connected things were in use worldwide in 2016, an increase of 30% on 2015, and this is expected to exceed 20.8 billion by 2020. IoT services are the now key drivers of growth with increasing attention on new transformative services by end-user organisations and vendors. IoT facilitated total services is expected to reach $13.5 billion in 2020.

It is possible to identify and supply many of the skills needed in the short-to-medium term to support the new technologies such as IoT. It is already clear, for example, that key underpinning technologies for IoT will be those that can communicate, store, analyse and secure the petabytes of data that will constantly emanate from the devices. This means that Cloud, Big Data, Mobility/Internet, Development/Transaction Technologies and Security will be even more critical and there will be a need for growing armies of practitioners to support them. While the demand for an array of technology skills will hugely increase, the skills themselves are in the evolutionary phase as opposed to completely new skill-sets.

At other times, the skills sets required in the wake of new technologies sit more easily in the revolutionary category. Big Data, for example, uses database technologies that are different to more traditional ones that were dominant in the 20th century. Big Data commonly uses non-relational databases and newer tools, such as Hadoop, to mine the information contained within them. For the most part, these revolutionary skills are the not the elite of degree and PhD level competencies, but rather require, particularly at the practitioner, level candidates who attain intermediate level skills in newer technologies. This places new demands and expectations on the tertiary education systems globally and their receptiveness, ability and appetite, to identify and deliver the skills, knowledge and competencies required.

A key message to be garnered from this document is guardedness of stereotype assumptions, leading to misrepresentation that only people with the highest educational attainment are exclusively competent, or attractive to roles in emerging technologies. Rather greater appreciation is required of the value of the hard 'listening' to employers with regard to the actualise skills and competencies required – which is a key characteristic of the Audit's methodology.



3. Supply and Demand

Currently, the Maltese ICT industry incorporates in the region of 250 companies, employing more than 7,000 people. Malta is quickly becoming a hub for the Digital Games Industry (iGaming). The sector is already the country's second biggest contributor to GDP, with more than 12% of its annual income coming through online gaming services. While manufacturing continues to be a significant accounting for 24% of economic output, there has been a shift away from labour intensive industries towards high added value ones, such as pharmaceuticals, information technology and automobiles.

Moreover, digital skills are permeating across all business sectors as ICT's become a central tenet of businesses development creating additional employment opportunities. The increasing reliance on digital skills across sectors is fuelling large demand for technical talent and certain skill-sets. The challenge for Malta, as for many developed economies, is its capacity to provide the industry with people with the required skills sets. Similarly, to encourage the optimum number of nationals, from across the social spectrum, to pursue tech related careers complemented with an appropriate level of immigrants.

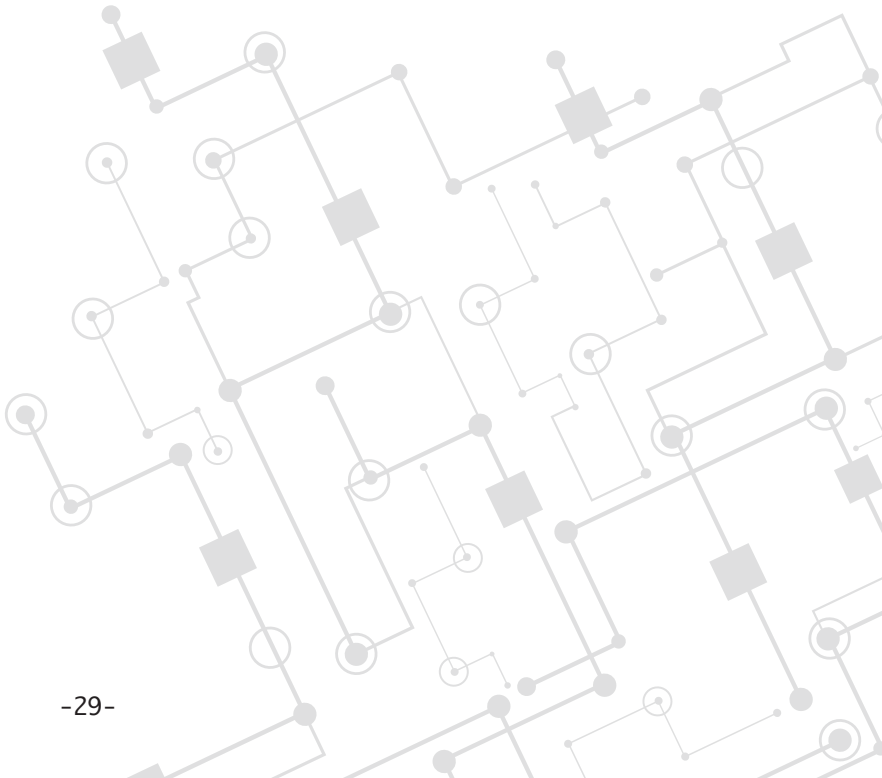
ICT education in Malta is largely delivered through 7 key providers, namely the University of Malta, Malta College of Arts Science and Technology (MCAST), Middlesex University, Computer Domain Academy offerings on Hertfordshire University and Durham University, Institute of Computer Education, STC Higher Education and Saint Martin's Institute of Higher Education offers on London University, as well as some emerging private providers. In response to growing demand, significant investments have been undertaken in upgrading the infrastructure of post-secondary education and increasing the capacity. Indeed, the number of ICT graduates increased significantly from 357, in 2006, to 788, in 2016. Yet, ICT capacity which equates to about 6% of total provision (academic year 2014/2015) of which 82.4% were male students, is struggling to keep pace with current need, resulting in a growing disparity between supply and demand of critical proportion, as the number of people employed in the ICT sector exceeded 7,000, in 2016. While there have been consistent efforts to increase the pipeline of tech graduates, the number of tertiary level (Further Education and Higher Education) ICT enrolments still remain relatively low.

Increasing numbers of foreign labour in workforce emphasises the extent of the tech-skills shortages within the Maltese labour force. The most recent National Employee Skills Survey

(June 2016) indicates that 48% of employers recruited foreign nationals in the previous three years, and currently 29% employ immigrants on a full-time basis. In reality, there has been a substantial increase in foreign nationals, from 1.3%, in 2000, to over 10% of the total workforce, in 2014. The role-composition of the immigrant workforce is somewhat diverse in terms of occupation encapsulating Management, Associate Professional, ICT, Administration/Clerical support, Hospitality and elementary occupations, and would seem to correlate well with areas of skills shortages and with positions of low demand among indigenous workers.

According to Cedefop skills mid-term forecasts (2015), most of Malta's growth job opportunities will be for professionals, service and sales workers, technicians and associate professionals. While some jobs will require first and second stage of tertiary education (Level 5 – Level 6), a significant proportion of job opportunities will require medium level qualifications (upper-secondary and post-secondary) non-tertiary education (Level 3 – Level 4).

The growing presence of IT companies in Malta has stimulated an increasing demand for tech-talent, resulting in bottleneck vacancies for particular skill-sets such as: software developers, systems/platform administrators, quality assurance, virtualisation, content management and analytics, social media and social engineering, security, software testers, language skill, ICT operations, technicians and administrators, as well as competencies in management, business development. The internet of things (IoT) being a revolutionary driver for growth within and beyond the tech sector, in the foreseeable future, will only exacerbate the demand for such skills, substantially, while demanding new skills sets yet to be defined.



4. Malta ICT Skills Audit Methodology

The Skills Audit model, first developed by FIT (FastTrack into Information Technology), in 2012, to capture the demands of the thriving tech sector in Ireland, is designed to accumulate granular skills needs data from leading ICT companies across a range of key disciplines. Adapting the model to the Maltese tech sector, the detailed questionnaire (Appendix 1) was completed with senior business development managers, and technology experts, in 34 companies during face-to-face interviews lasting on average a minimum of one hour, in October, 2016. The face-to-face interviews, expedited by experienced senior FIT personnel, facilitated in-depth discussion and the acquisition of invaluable qualitative inputs that strengthened the interpretation of the quantitative data.

Respondents were asked to quantify the scale of their current need for more employees who could carry out each of over 250 specific skill-sets, categorised within fourteen occupational disciplines, plus three key areas of transferable skills, namely Project Management, Problem-Solving Skills and Professional Development. The specific skills and disciplines are not exhaustive, but adopted after extensive consultation, as a robust framework that the industry itself currently endorses as meaningful and adequate to the task of capturing their skills needs. Other supplementary questions considered key vacancies, general recruitment needs, and insights on current recruitment streams.

In the light of the rapid pace of technological change in an industry (sketched above) where 18 months is a long time, the framework is a 'live' structure that has to evolve between successive audits to make sure that in-demand skills are being captured as reliably as possible. In this regard, it is important to note in the period since FIT completed its most recent Skills Audit in Ireland which was published in October, 2014, with the support of IBM- on reviewing and updating the template content to commence the Malta Audit in October, 2016, resulted in a 30% - 40% evolution in the disciplines as new technologies and/or work practices were adopted - in such a relatively short period.

Significantly, respondents are asked to consider and classify the level at which employees would ideally need to be able to exercise each skill to be hired in the categories of 'expert', 'competent' or 'entry' level. These skill levels are defined as follows:

- Entry level - jobs that call for a set of useable ICT practitioner skills, and where the employee requires some technical proficiency, and largely works in a well structured environment and/or is supported by regular supervision or mentoring.

- Competent level - jobs that call for a set of well-established ICT practitioner and/or substantive technical competencies, where the employee works independently on individual tasks, or as a fully-fledged team member with occasional supervision.

- Expert level - jobs that call for a set of advanced ICT practitioner skills, and/or strong technical knowhow, where the employee works as a technology expert or leads technical teams and projects.

The classification and methodology adopted attempts to give greater clarity as to the roles and the particular skills in demand in this constantly evolving sector. It challenges a consistent misconception that the ICT skills gap is exclusively, or even largely made up of roles at the apex of the skills pyramid - at the 'expert level'.

The findings show an undersupply of experts - meaning people with advanced technological and technical capabilities combined with industry experience. However, the Audit significantly captures a greater extent of demand in the ICT sector for people with a combination of technical knowledge, applied skills, and competencies combined with professional experience and transferable skills to work in what is a fast-changing sector. The tech sector in Malta currently has a healthy appetite for recruits (indigenous and immigrant) - who display underlying and intermediary ICT skills with the necessary application and attitude.



Figure 3

A recent Cedefop review of Apprenticeships in Malta (2015), highlighted a number of issues, which if addressed, could support the skills agenda namely, an apparent mismatch between current apprenticeship offers and labour market needs, no offerings and/or insufficient placements in certain sectors with shortages of skilled workers, no, or limited involvement of labour market representatives in defining current apprenticeship offers, legislative restrictions needing. The report also highlighted that current fragmentation, within sectors, impeded a coherent picture of skill-needs at sector level, and a degree of ambiguity with respect to decision-making in relation to provision of apprenticeship.

Survey respondents were also asked to indicate the existing headcount of their employees, by discipline, and where possible, to estimate the number of potential vacancies that they might have in particular disciplines over the next 18 months (as distinct from immediate vacancies). Over 75% of the respondents elected to provide some, or all, of this information. Where complete information was given, it was possible to quantify the growth in employment anticipated in each discipline, and these ranged from 10% to over 90% with a median of 34%. This information was correlated with a composite analysis of leading recruitment agencies operating in Malta in the sphere of ICT and tech related sectors, and the particular vacancies advertised during the last quarter of 2016.

5. Data Analysis

The Malta ICT Skills Audit estimates that the tech sector has an immediate requirement for 600 additional employees, and this will escalate significantly over the next 18 months. The number of actual vacancies vouched for, by the companies surveyed, was correlated and complemented with a number of relevant data-streams and extrapolated for the sector as a whole. It is conservatively estimated that the employment potential within the sector, up to 2020, is in excess of 4,000 additional roles, subject to the provision of appropriate training programmes, and access to a healthier talent pipeline. However, as discussion elsewhere in this report makes clear, the ideal level of responsiveness of tertiary education provision needs review in light of existing demands, and new job creation opportunities. Should the supply side be impeded in its ability to respond, it will exacerbate an already challenging skills shortage facing the Maltese tech sector, and bring vulnerability with regard to the maximisation of employment opportunities in ICT related areas.

Drafting this report, cognisance was given to the current Maltese Employment Policy, National Youth Policy, the National Digital Strategy, the Framework for the Educational Strategy 2024, Budget 2017 priorities, Jobsplus 2017 priorities, key Employer Surveys and the National Employees Skills Survey, 2016, as well extensive research into recruitment demand on the island. As stated, the findings this audit suggest in the region of 600 current vacancies – informed by in-depth research into the volume and type of vacancies being promoted by leading recruitment agencies operating in the tech sector, in addition to the empirical data supplied by tech companies who participated in the audit. Taking into account their proportion of the sector as a whole, and their expressed disquiet in being able to have their recruitment needs satisfied quickly.

Findings also show strong growth and increasing opportunity within the tech related sectors in Malta, with the potential for about an additional 3,500 - 4,000 jobs by 2020. However, diminishing access to appropriate skills, and competencies, has now become a significant drag on this potential, which if unaddressed, could result in tech companies having to consider other options to support their future growth and development.

The level of demand for competent and entry-level skills requirements may come as a surprise to some readers - with 67% of immediate vacancies are for employees able to exercise skills, at the competent and entry-levels, as the pie chart in Fig 4 illustrates, and just 33% at the expert



Figure 4

level. The bar chart in Fig 5 shows the level of competence required by discipline; experts are most required to work in areas such a Digital Skills, e-Business and Software Development, whereas people with entry- level skill-sets are most required in areas such as Networking Technologies, Platform Administration and Service Support.

The survey responses were also analysed to determine the specific skills most in demand for each discipline. This information is presented in radar charts, which present the data in a form

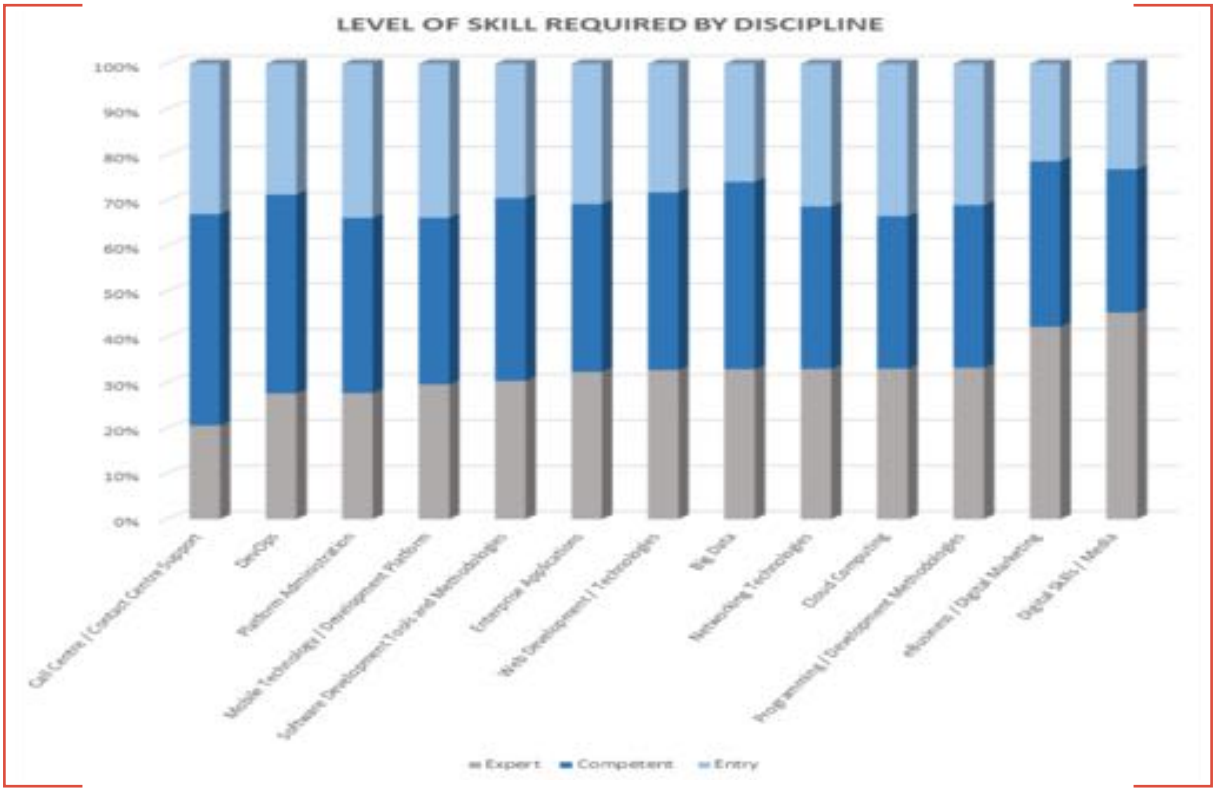


Figure 5

easy to assimilate, and which gives readers an overview of the intensity of demand reported for each specific skill with a discipline. In each radar diagram:

- The outermost ring representing the highest demand for a specific skill
- All rings represent significant demand, even the inner ones
- Different coloured symbols illustrate demand for entry, competent, and expert levels
- A table gives the same information in the form of a ranked list, with the number 1 place occupied by the most in-demand skill

Readers of this report are invited to explore the top ranked skills/high demand roles as set out in the radar diagrams and tables, which follow for any of the disciplines which are of particular interest to them, or indeed, all the disciplines if a comprehensive understanding is required. For those who only need an overall understanding of skills needs, the following general findings should prove useful.

General Trends in Relation to ICT Skills' Demand

In the **Programming / Development Methodologies** discipline demand is highest for those with SQL, .Net and JavaScript allied to Problem Solving and Project Management skills. The ranking order of demand is unusually identical across skills' levels indicating a well-defined and currently predictable skills demand for this discipline.

The most in demand skill sets in the discipline of **Software Development Tools and Methodologies** are for know-how in Agile and similar methods which share the same philosophy and seek to optimise how teams work effectively at any scale. Thereafter proficiency in Software Testing and Project Management / Problem Solving are most valued.

In **Mobile Development** there was a strong demand for HTML5, CSS and .Net skills. Cross-platform development framework Xamarin ranks highly - developers can quickly create apps by coding in C# which can then be shared across multiple platforms such as iOS and Android. Xamarin skills could be a good calling card for those aspiring to join at entry level.

In **Cloud Computing** the most used platform in Malta is Microsoft Cloud/Azure/Office 365 although it should be noted that the Amazon Web Services features also ranking 4th. Skills sets in both would certainly give new entrants access to a range of employment opportunities as would competency in Web Services especially SOAP and REST.

SQL is presenting as a somewhat transversal requirement across **Web Development and Programming** environments in Malta. Similarly, HTML5 and CSS skills are a top ranking requirement in both Web and Mobile Development disciplines signalling the shared technologies in these disciplines although this could change in future tech evolutions.

In **Platform Administration** the Microsoft related skills sets are most in demand in Malta although the VMWare skill set is also ranked highly. The Microsoft Certified Solutions Expert (MCSE) certifications are clearly a currency that employers' value and attainment of one or more of these by aspiring new entrants would demonstrate competency and commitment.

Most needed skill-sets in the **DevOps** category are in Microsoft cloud and virtualisation technologies. Competencies in creating virtual platforms in the cloud, or on premise, using Microsoft technology and its Azure platform, are highly valued by Maltese employers.

In the discipline of **Networking/PC Maintenance,** the hottest demand is for those with Network Security skills. Interestingly, at entry, employers are looking at Problem Solvers as an essential trait allied to having solid network and server skills.

In Malta, the **Big Data** category most frequently uses Microsoft SQL and Azure technologies. Scaffolding skills sets include Machine Learning, Data Mining and Statistical Analysis. SQL and Azure are highly transferrable skill-sets that can be used in many of the disciplines examined, whereas competency using Azure data insights tools and attaining the scaffolding skill-sets noted above, offers a specialisation in the growing Big Data field.

Skills in high demand for **Enterprise Applications** are mostly Microsoft centred. For example, the top three are in the Microsoft family, namely SQL, Dynamics CRM and SharePoint. Core skills required are strong database configuration and programming competencies.

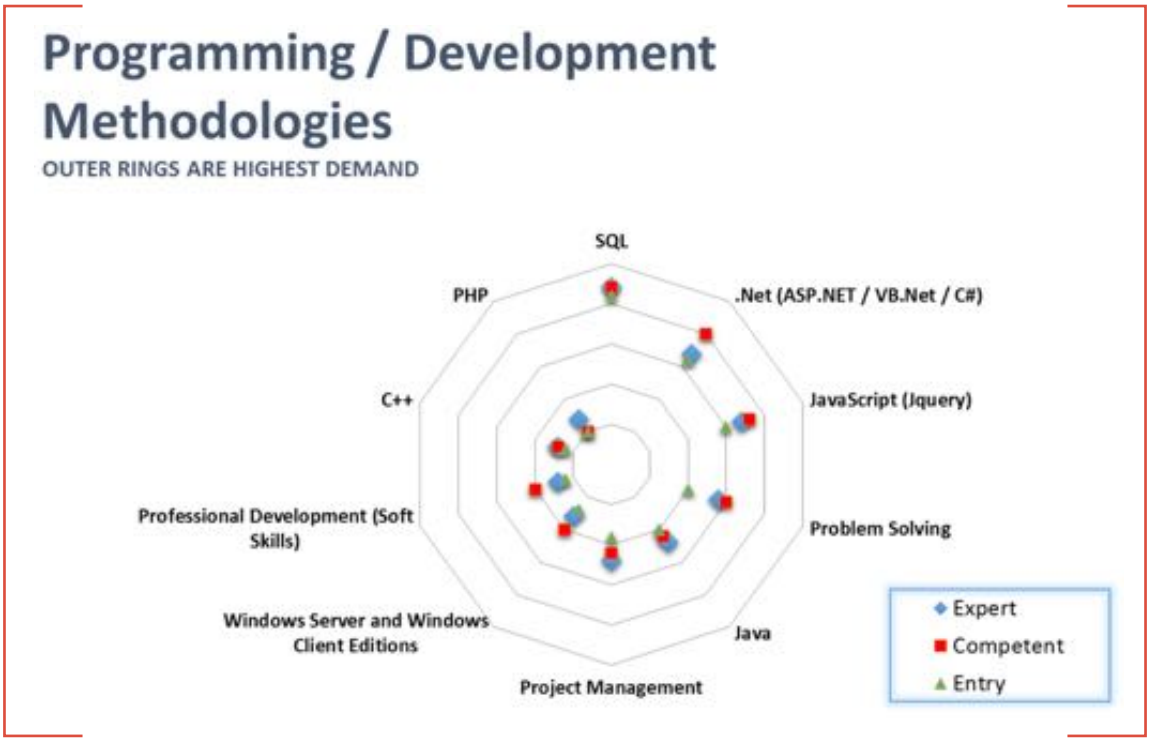
In the **e-Business / Digital Marketing** discipline, a Google Analytics skill-set stands out as most in demand. The current need in Malta for professionals in the field to be multi-taskers requires a basket of different skills, such as HTML5 & CSS, SEO & SEM and Adobe Photoshop. These are quite attainable for those to wish enter the sector and have a passion for this field of work.

The overriding skill-sets in demand were those related to **Customer Service Principles and Practices**. Customer Service Experience was required for competent and expert level roles, whereas at entry level, more emphasis was placed on demonstrating Soft Skills.

In the **Digital Skills / Media** discipline, a grounding in CSS, HTML5, JavaScript, Angular, Photoshop and Illustrator would provide a solid set of entry level skills.

DISCIPLINE 1:

In the Programming/Development Methodologies, discipline demand is highest for those with SQL, .Net and JavaScript allied to Problem-Solving and Project Management skills. The ranking order of demand is unusually identical across skills' levels indicating a well-defined and currently predictable skills demand for this discipline.

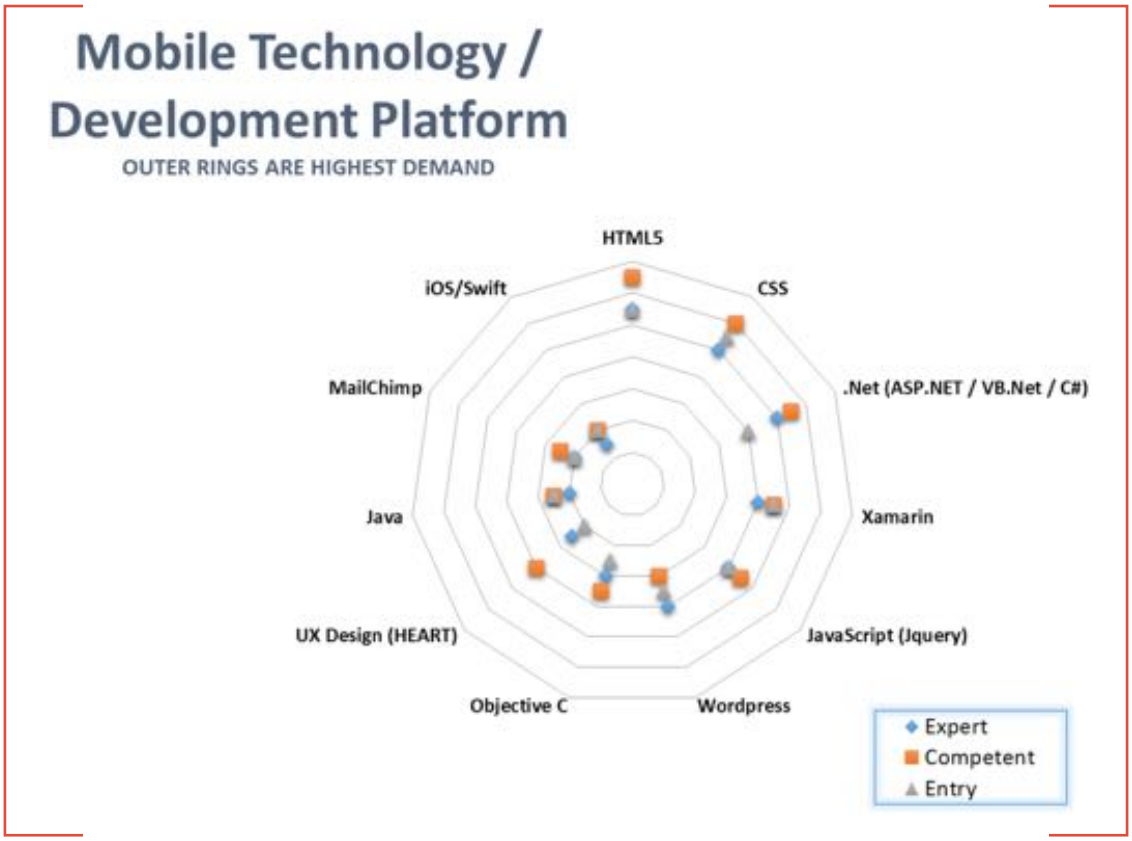


Highest Demand Ranked by Most Needed

Rank	Entry Level	Competent Level	Expert Level
1	SQL	SQL	SQL
2	.Net (ASP.NET / VB.Net / C#)	.Net (ASP.NET / VB.Net / C#)	.Net (ASP.NET / VB.Net / C#)
3	JavaScript (jQuery)	JavaScript (jQuery)	JavaScript (jQuery)
4	Problem Solving	Problem Solving	Problem Solving
5	Java	Java	Java
6	Project Management	Project Management	Project Management
7	Windows Server and Windows Client Editions	Windows Server and Windows Client Editions	Windows Server and Windows Client Editions
8	Professional Development (Soft Skills)	Professional Development (Soft Skills)	Professional Development (Soft Skills)

DISCIPLINE 2:

In Mobile Development, there was a strong demand for HTML5, CSS and .Net skills. Cross-platform development framework Xamarin ranks highly - developers can quickly create apps by coding in C# which can then be shared across multiple platforms, such as iOS and Android. Xamarin skills could be a good calling card for those aspiring to join at entry level.

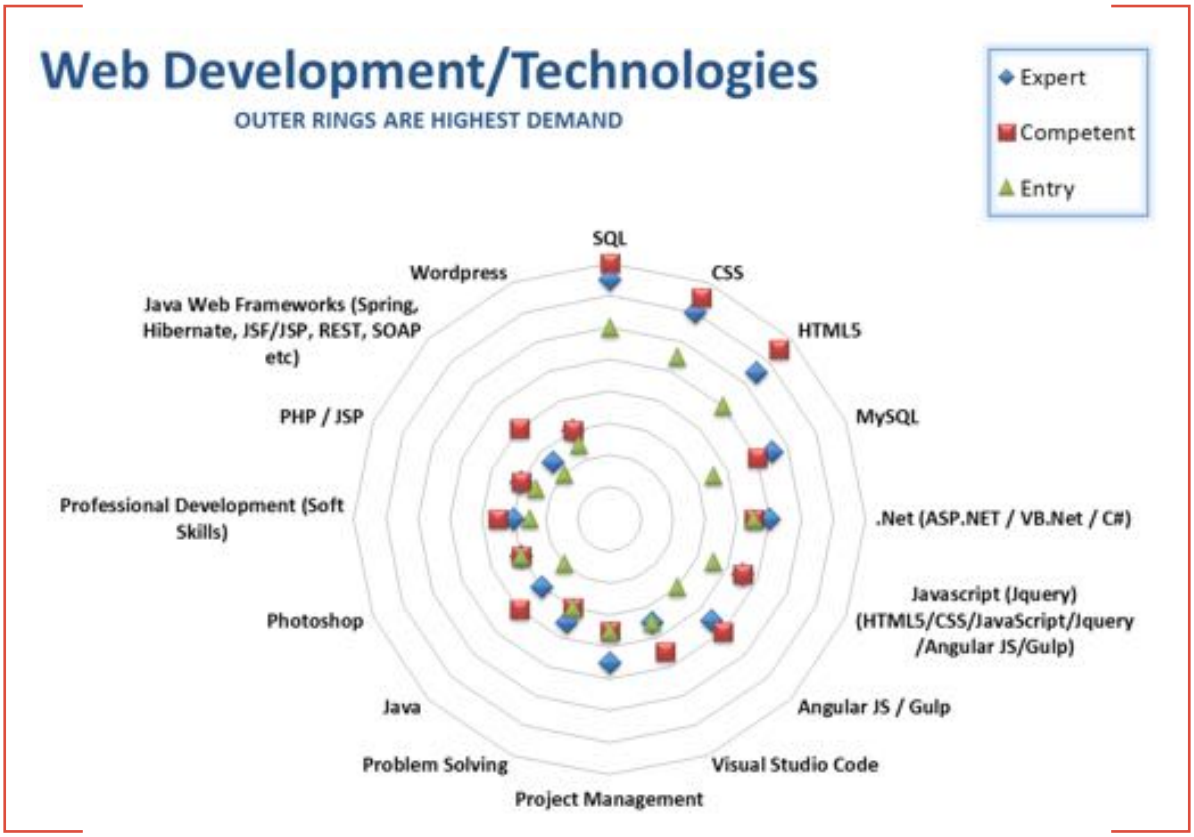


Highest Demand Ranked by Most Needed

Rank	Entry Level	Competent Level	Expert Level
1	HTML5	HTML5	HTML5
2	CSS	CSS	CSS
3	Xamarin	.Net (ASP.NET / VB.Net / C#)	.Net (ASP.NET / VB.Net / C#)
4	.Net (ASP.NET / VB.Net / C#)	Xamarin	Xamarin
5	JavaScript (jQuery)	JavaScript (jQuery)	JavaScript (jQuery)
6	Wordpress	Wordpress	Wordpress
7	Objective C	UX Design (HEART)	Objective C
8	UX Design (HEART)	Objective C	UX Design (HEART)

DISCIPLINE 3:

SQL is presenting as a somewhat transversal requirement across Web Development and Programming environments in Malta. Similarly, HTML5 and CSS skills are a top ranking requirement, in both Web and Mobile Development disciplines, signalling the shared technologies in these disciplines, although this could change in future tech evolutions.

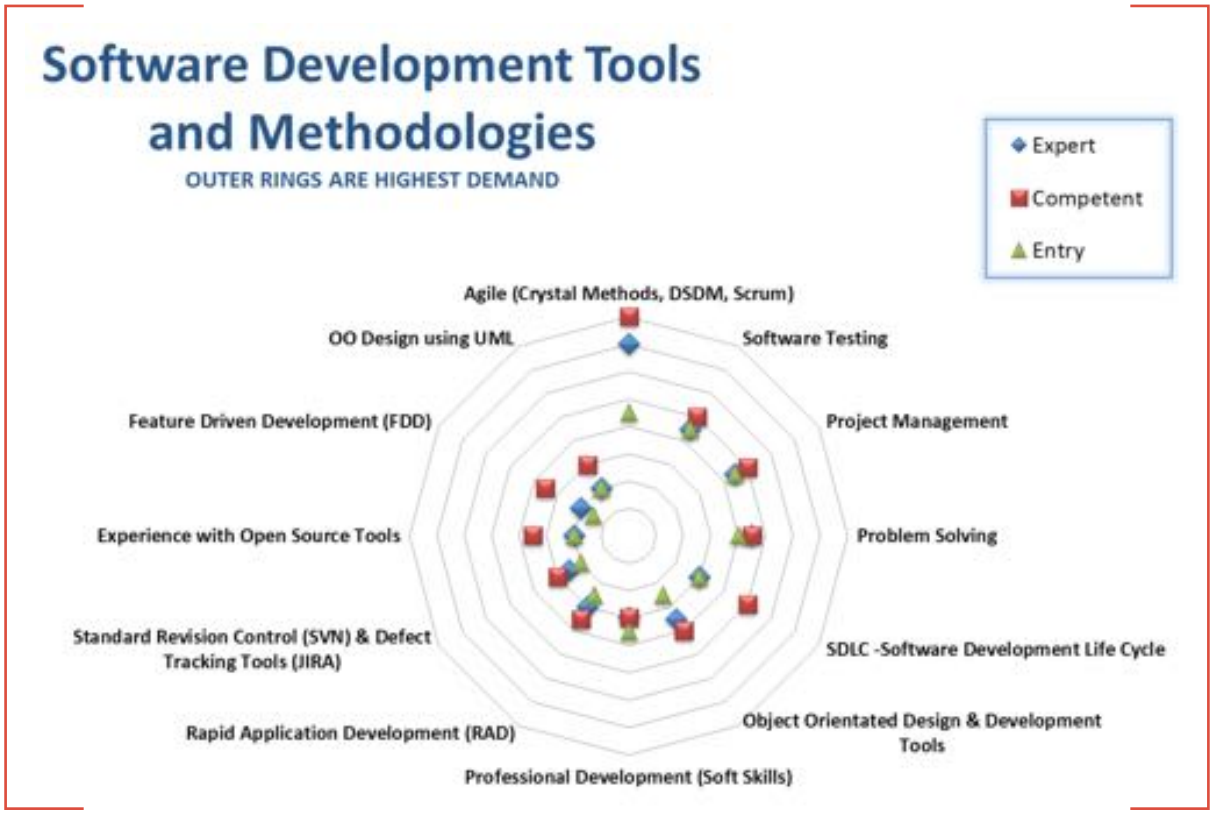


Highest Demand Ranked by Most Needed

Rank	Entry Level	Competent Level	Expert Level
1	SQL	SQL	SQL
2	CSS	CSS	CSS
3	HTML5	HTML5	HTML5
4	.Net (ASP.NET / VB.Net / C#)	MySQL	MySQL
5	MySQL	Angular JS / Gulp	.Net (ASP.NET / VB.Net / C#)
6	JavaScript (jQuery)	.Net (ASP.NET / VB.Net / C#)	JavaScript (jQuery)
7	Visual Studio Code	JavaScript (jQuery)	Angular JS / Gulp
8	Angular JS / Gulp	Visual Studio Code	Visual Studio Code

DISCIPLINE 4:

The most in-demand skill-sets, in the discipline of Software Development Tools and Methodologies, are for know-how in Agile and similar methods which share the same philosophy, and seek to optimise how teams work effectively at any scale. Thereafter, proficiency in Software Testing and Project Management/Problem-Solving is most valued.

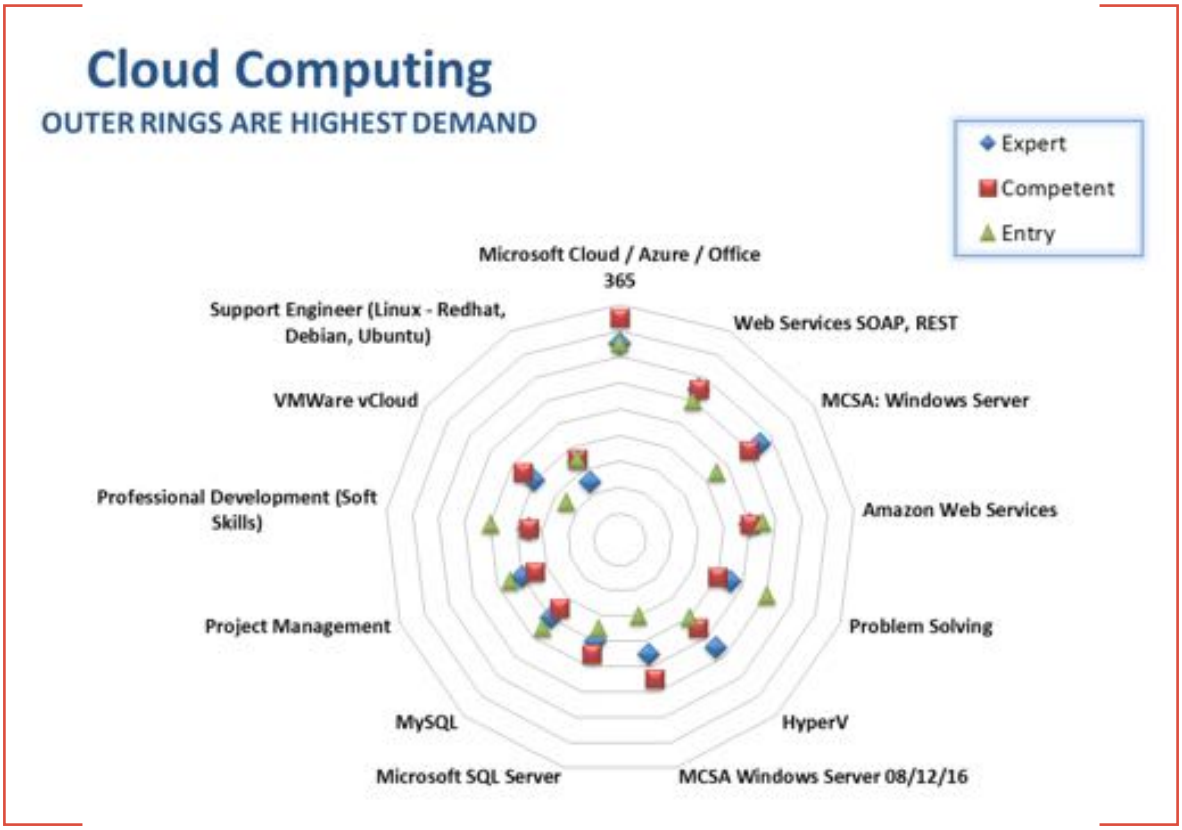


Highest Demand Ranked by Most Needed

Rank	Entry Level	Competent Level	Expert Level
1	Agile (Crystal Methods, DSDM, Scrum)	Agile (Crystal Methods, DSDM, Scrum)	Agile (Crystal Methods, DSDM, Scrum)
2	Software Testing	Software Testing	Software Testing
3	Project Management	Project Management	Project Management
4	Problem Solving	SDLC -Software Development Life Cycle	Problem Solving
5	Professional Development (Soft Skills)	Problem Solving	Object Orientated Design & Development Tools
6	SDLC -Software Development Life Cycle	Object Orientated Design & Development Tools	SDLC -Software Development Life Cycle
7	Object Orientated Design & Development Tools	Professional Development (Soft Skills)	Professional Development (Soft Skills)
8	Rapid Application Development (RAD)	Rapid Application Development (RAD)	Rapid Application Development (RAD)

DISCIPLINE 5:

In Cloud Computing, the most used platform in Malta is Microsoft Cloud/Azure/Office 365, although it should be noted that the Amazon Web Services features is also ranking 4th. Skills sets, in both, would certainly give new entrants access to a range of employment opportunities, as would competency in Web Services, especially SOAP and REST.

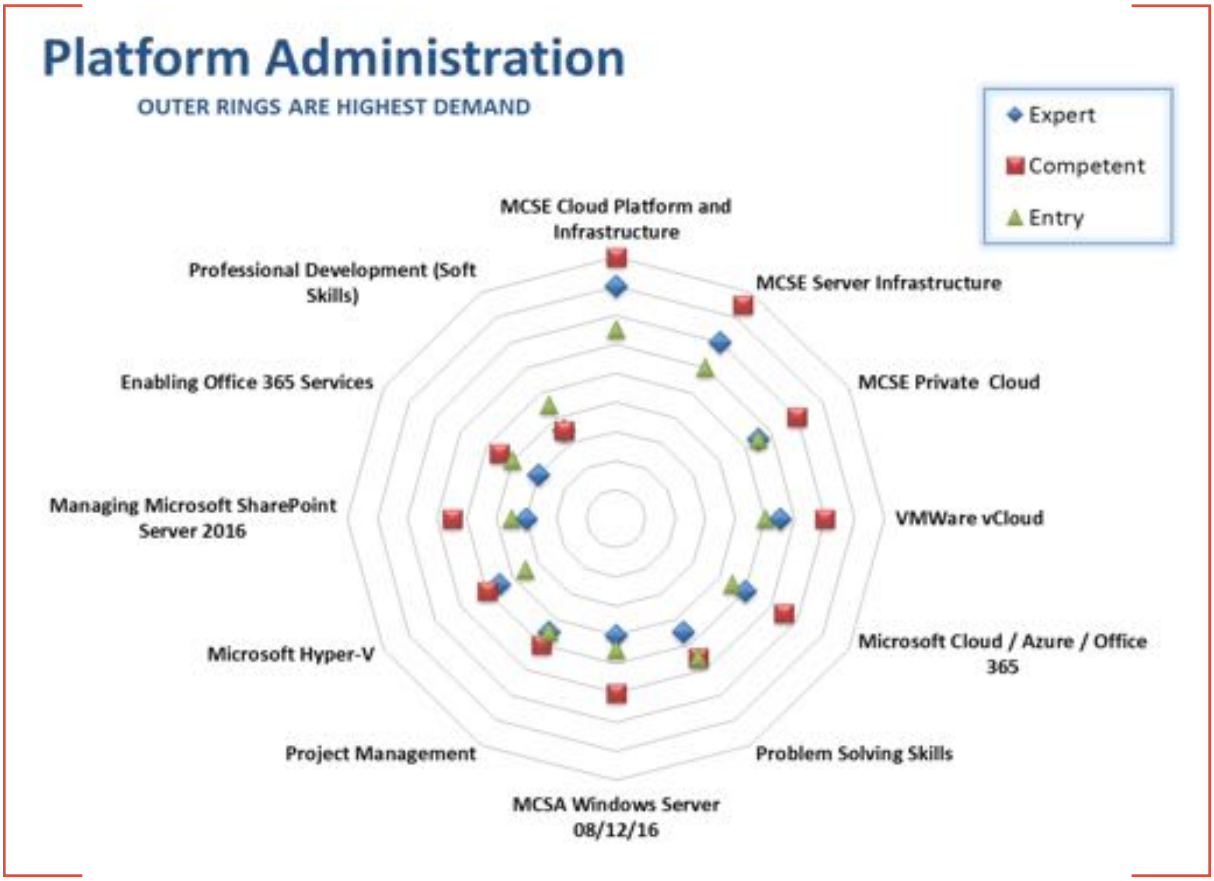


Highest Demand Ranked by Most Needed

Rank	Entry Level	Competent Level	Expert Level
1	Microsoft Cloud / Azure / Office 365	Microsoft Cloud / Azure / Office 365	Microsoft Cloud / Azure / Office 365
2	Web Services SOAP, REST	Web Services SOAP, REST	Web Services SOAP, REST
3	Problem Solving	MCSA: Windows Server	MCSA: Windows Server
4	Amazon Web Services	Amazon Web Services	Amazon Web Services
5	MCSA: Windows Server	Problem Solving	HyperV
6	HyperV	MCSA Windows Server 08/12/16	Problem Solving
7	MCSA Windows Server 08/12/16	HyperV	MCSA Windows Server 08/12/16
8	Microsoft SQL Server	Microsoft SQL Server	Microsoft SQL Server

DISCIPLINE 6:

In Platform Administration, the Microsoft-related skills sets are most in demand in Malta, although the VMWare skill-set is also ranked highly. The Microsoft Certified Solutions Expert (MCSE) certifications are clearly a currency that employers' value and attainment of one, or more, of these by aspiring new entrants, would demonstrate competency and commitment.

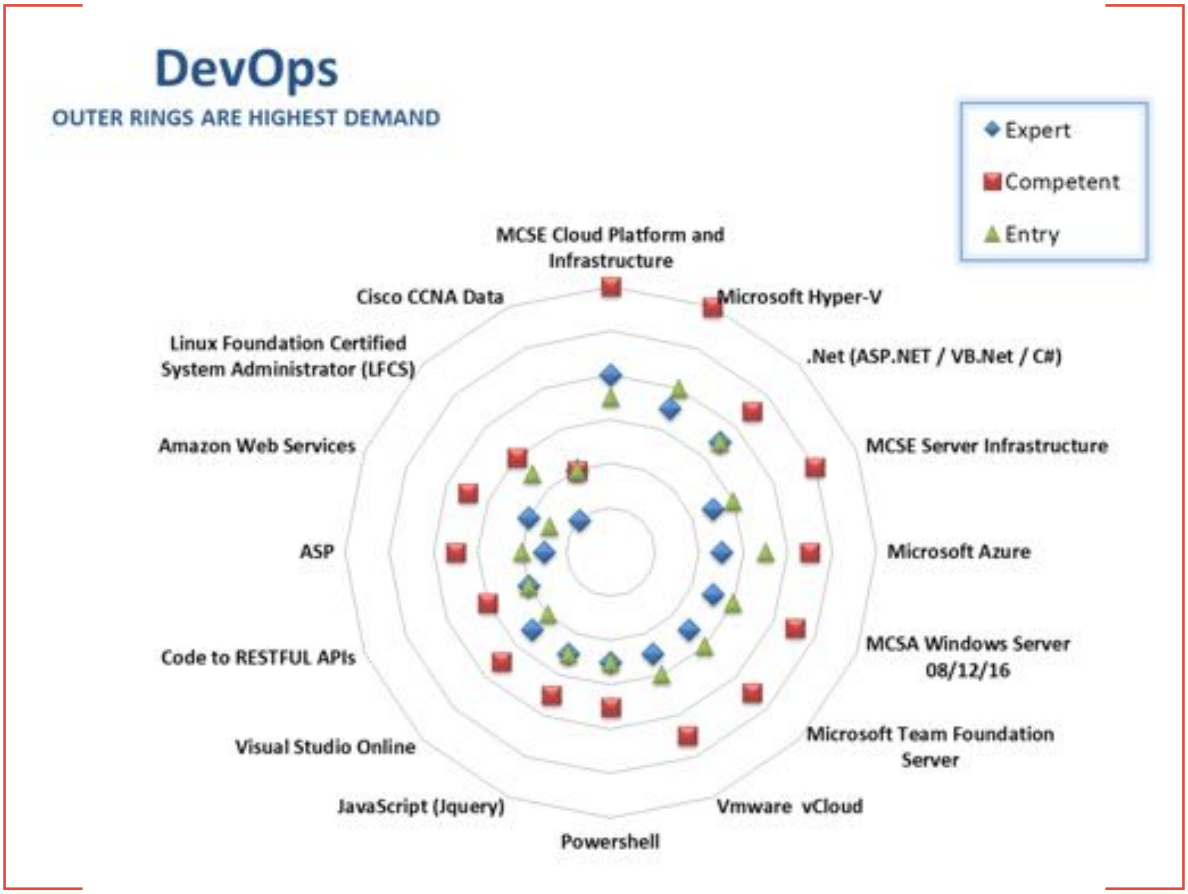


Highest Demand Ranked by Most Needed

Rank	Entry Level	Competent Level	Expert Level
1	MCSE Cloud Platform and Infrastructure	MCSE Cloud Platform and Infrastructure	MCSE Cloud Platform and Infrastructure
2	MCSE Server Infrastructure	MCSE Server Infrastructure	MCSE Server Infrastructure
3	MCSE Private Cloud	MCSE Private Cloud	MCSE Private Cloud
4	VMWare vCloud	VMWare vCloud	VMWare vCloud
5	Problem Solving Skills	Microsoft Cloud / Azure / Office 365	Microsoft Cloud / Azure / Office 365
6	Microsoft Cloud / Azure / Office 365	MCSA Windows Server 08/12/16	Problem Solving Skills
7	MCSA Windows Server	Problem Solving Skills	Project Management
8	Project Management	Project Management	MCSA Windows Server

DISCIPLINE 7:

Most needed skill-sets in the DevOps category are in Microsoft cloud and virtualisation technologies. Highly valued by Maltese employers is a competency in creating virtual platforms in the cloud, or on premise, using Microsoft technology and its Azure platform.

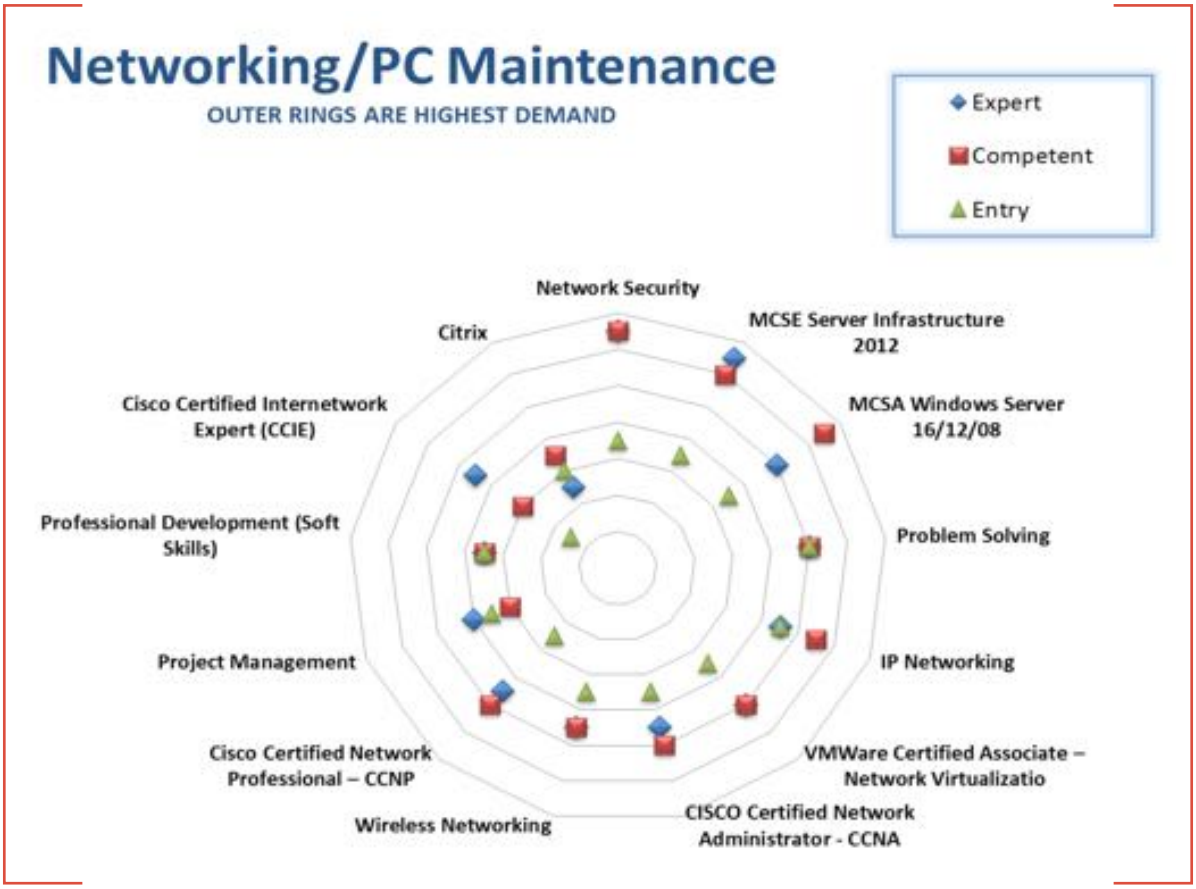


Highest Demand Ranked by Most Needed

Rank	Entry Level	Competent Level	Expert Level
1	Microsoft Hyper-V	MCSE Cloud Platform and Infrastructure	MCSE Cloud Platform and Infrastructure
2	MCSE Cloud Platform and Infrastructure	Microsoft Hyper-V	Microsoft Hyper-V
3	.Net (ASP.NET / VB.Net / C#)	MCSE Server Infrastructure	.Net (ASP.NET / VB.Net / C#)
4	MCSE Server Infrastructure	.Net (ASP.NET / VB.Net / C#)	MCSE Server Infrastructure
5	Microsoft Azure	Microsoft Azure	Microsoft Azure
6	MCSA Windows Server 08/12/16	MCSA Windows Server 08/12/16	MCSA Windows Server 08/12/16
7	Microsoft Team Foundation Server	Microsoft Team Foundation Server	Microsoft Team Foundation Server
8	Vmware vCloud	Vmware vCloud	Vmware vCloud

DISCIPLINE 8:

In the discipline of Networking/PC Maintenance, the hottest demand is for those with Network Security skills. Interestingly, at entry, employers are looking at a Problem-Solver as an essential trait allied to having solid network and server skills.

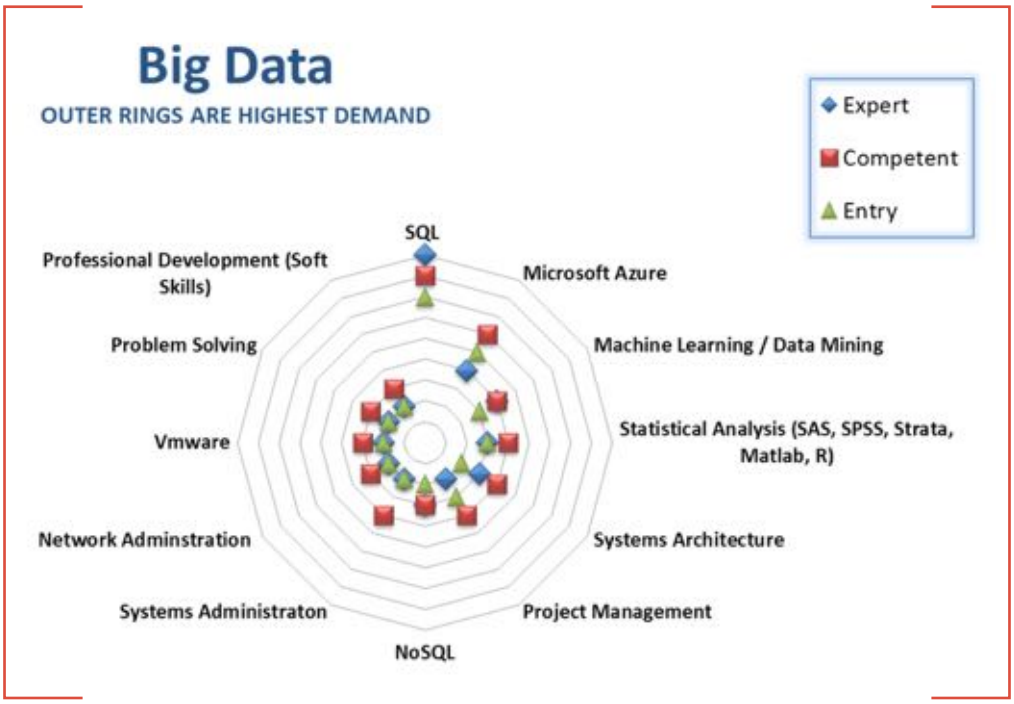


Highest Demand Ranked by Most Needed

Rank	Entry Level	Competent Level	Expert Level
1	Problem Solving	Network Security	Network Security
2	IP Networking	MCSA Windows Server 16/12/08	MCSE Server Infrastructure 2012
3	Network Security	MCSE Server Infrastructure 2012	MCSA Windows Server 16/12/08
4	MCSE Server Infrastructure 2012	IP Networking	Problem Solving
5	MCSA Windows Server 16/12/08	Problem Solving	VMWare Cert. Associate – Network Virtualization
6	VMWare Cert. Associate – Network Virtualization	VMWare Cert. Associate – Network Virtualization	IP Networking
7	CISCO Certified Network Administrator - CCNA	CISCO Certified Network Administrator - CCNA	CISCO Certified Network Administrator - CCNA
8	Wireless Networking	Wireless Networking	Wireless Networking

DISCIPLINE 9:

In Malta, the Big Data category most frequently uses Microsoft SQL and Azure technologies. Scaffolding skills sets include Machine Learning, Data Mining and Statistical Analysis. SQL and Azure are highly transferrable skill-sets that can be used in many of the disciplines examined, whereas competency using Azure data insights tools, and attaining the scaffolding skill sets noted above, offers a specialisation in the growing Big Data field.

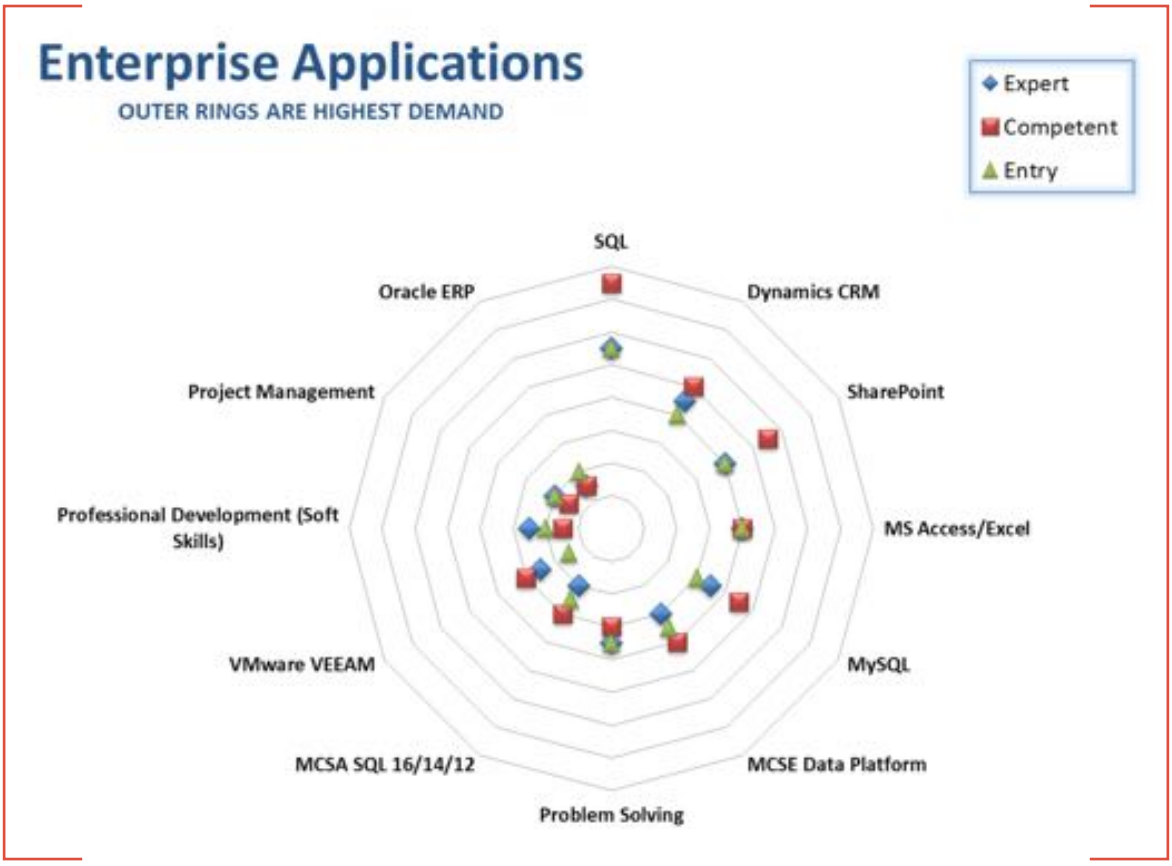


Highest Demand Ranked by Most Needed

Rank	Entry Level	Competent Level	Expert Level
1	SQL	SQL	SQL
2	Microsoft Azure	Microsoft Azure	Microsoft Azure
3	Machine Learning / Data Mining	Machine Learning / Data Mining	Machine Learning / Data Mining
4	Statistical Analysis (SAS, SPSS, Strata, Matlab, R)	Statistical Analysis (SAS, SPSS, Strata, Matlab, R)	Statistical Analysis (SAS, SPSS, Strata, Matlab, R)
5	Project Management	Systems Architecture	Systems Architecture
6	Systems Architecture	Project Management	NoSQL
7	NoSQL	Systems Administration	Project Management
8	Systems Administration	NoSQL	Systems Administration

DISCIPLINE 10:

Skills in high demand for Enterprise Applications are mostly Microsoft centred. For example, the top three are in the Microsoft family, namely SQL, Dynamics CRM and SharePoint. Core skills required are strong database configuration and programming competencies.



Highest Demand Ranked by Most Needed

Rank	Entry Level	Competent Level	Expert Level
1	SQL	SQL	SQL
2	Dynamics CRM	SharePoint	Dynamics CRM
3	SharePoint	Dynamics CRM	SharePoint
4	MS Access/Excel	MySQL	MS Access/Excel
5	MCSE Data Platform	MS Access/Excel	MySQL
6	Problem Solving	MCSE Data Platform	Problem Solving
7	MySQL	Problem Solving	MCSE Data Platform
8	MCSA SQL 16/14/12	MCSA SQL 16/14/12	MCSA SQL 16/14/12

DISCIPLINE 11:

In the e-Business/Digital Marketing discipline, a Google Analytics skill-set stands out as most in demand. The current need in Malta for professionals in the field to be multi-taskers requires a basket of different skills, such as HTML5 & CSS, SEO & SEM, and Adobe Photoshop. These are quite attainable for those who wish to enter the sector and have a passion for this field of work.



Highest Demand Ranked by Most Needed

Rank	Entry Level	Competent Level	Expert Level
1	Google Analytics	Google Analytics	Google Analytics
2	Search Engine Optimisation (SEO)	Search Engine Optimisation (SEO)	HTML5
3	Adobe Photoshop	HTML5	Search Engine Optimisation (SEO)
4	SEM - Pay Per Click (Google Adwords etc.)	Adobe Photoshop	Adobe Photoshop
5	HTML5	CSS	SEM - Pay Per Click (Google Adwords etc.)
6	CSS	Google Keyword Planner	CSS
7	Adobe Illustrator	SEM - Pay Per Click (Google Adwords etc.)	Google Keyword Planner
8	Google Keyword Planner	Adobe Illustrator	Adobe Illustrator

DISCIPLINE 12:

The overriding skill-sets in demand were those related to Customer Service Principles and Practices. Customer Service Experience was required for competent and expert level roles, whereas at entry level, more emphasis was placed on demonstrating Soft Skills.

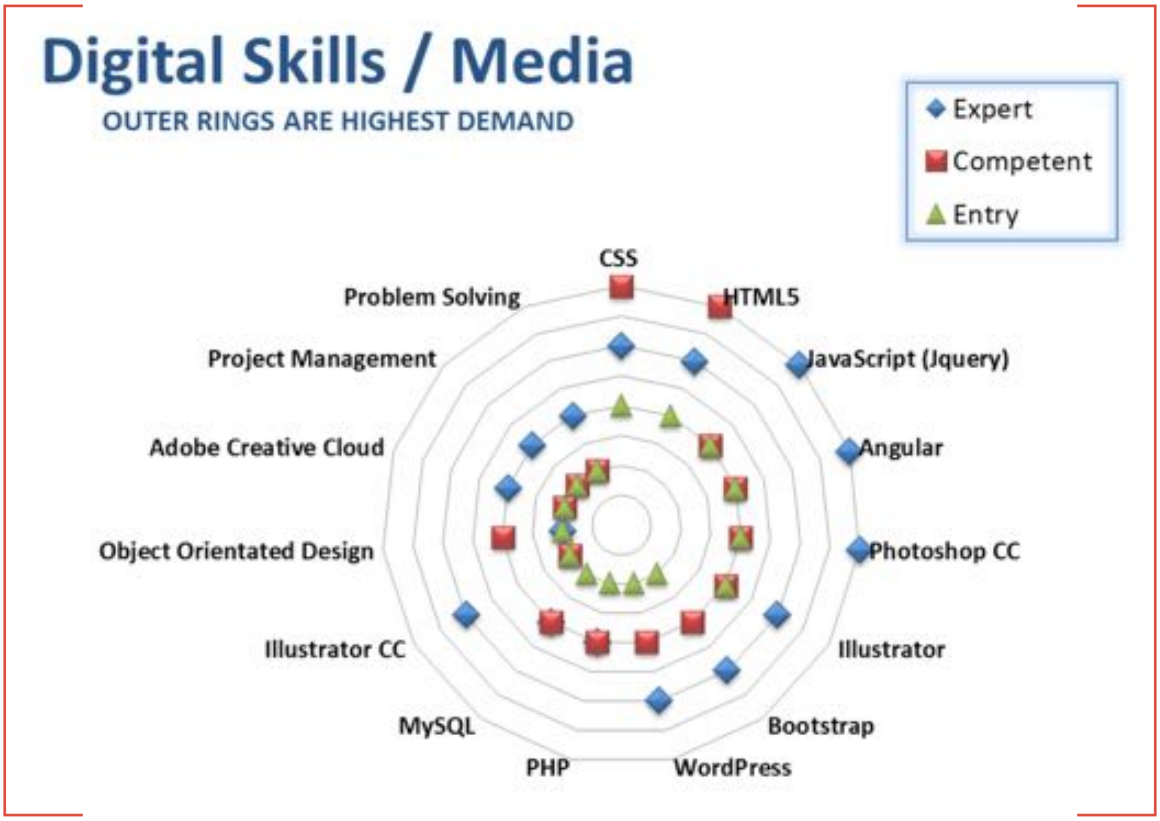


Highest Demand Ranked by Most Needed

Rank	Entry Level	Competent Level	Expert Level
1	Knowledge of Customer Service Principles & Practices	Knowledge of Customer Service Principles & Practices	Knowledge of Customer Service Principles & Practices
2	Project Management	Customer Service Experience	Project Management
3	Professional Development (Soft Skills)	Project Management	Customer Service Experience
4	Relevant Product Knowledge	Proficient in relevant Computer Applications	Customer Facing
5	Proficient in relevant Computer Applications	Professional Development (Soft Skills)	Professional Development (Soft Skills)
6	Customer Service Experience	Good Data Entry/Keyboard Skills	Proficient in relevant Computer Applications
7	Good Data Entry/Keyboard Skills	Relevant Product Knowledge	Relevant Product Knowledge
8	Customer Facing	Customer Facing	Good Data Entry/Keyboard Skills

DISCIPLINE 13:

In the Digital Skills/Media discipline a grounding in CSS, HTML5, JavaScript, Angular, Photoshop and Illustrator, would provide a solid set of entry-level skills.



Highest Demand Ranked by Most Needed

Rank	Entry Level	Competent Level	Expert Level
1	CSS	CSS	JavaScript (jQuery)
2	HTML5	HTML5	Angular
3	JavaScript (jQuery)	JavaScript (jQuery)	Photoshop CC
4	Angular	Angular	CSS
5	Photoshop CC	Photoshop CC	HTML5
6	Illustrator	Illustrator	Illustrator
7	Bootstrap	Bootstrap	Bootstrap
8	WordPress	WordPress	WordPress

DISCIPLINE A:

The Project Management sphere's strongest requirement is for those with a skills-set related to the use of Agile/Scrum/Kanban methods and processes. Competencies in Prince II and ITIL are also well recognised by employers. Following those, people management, planning and demonstration of experience, are considered strengths.

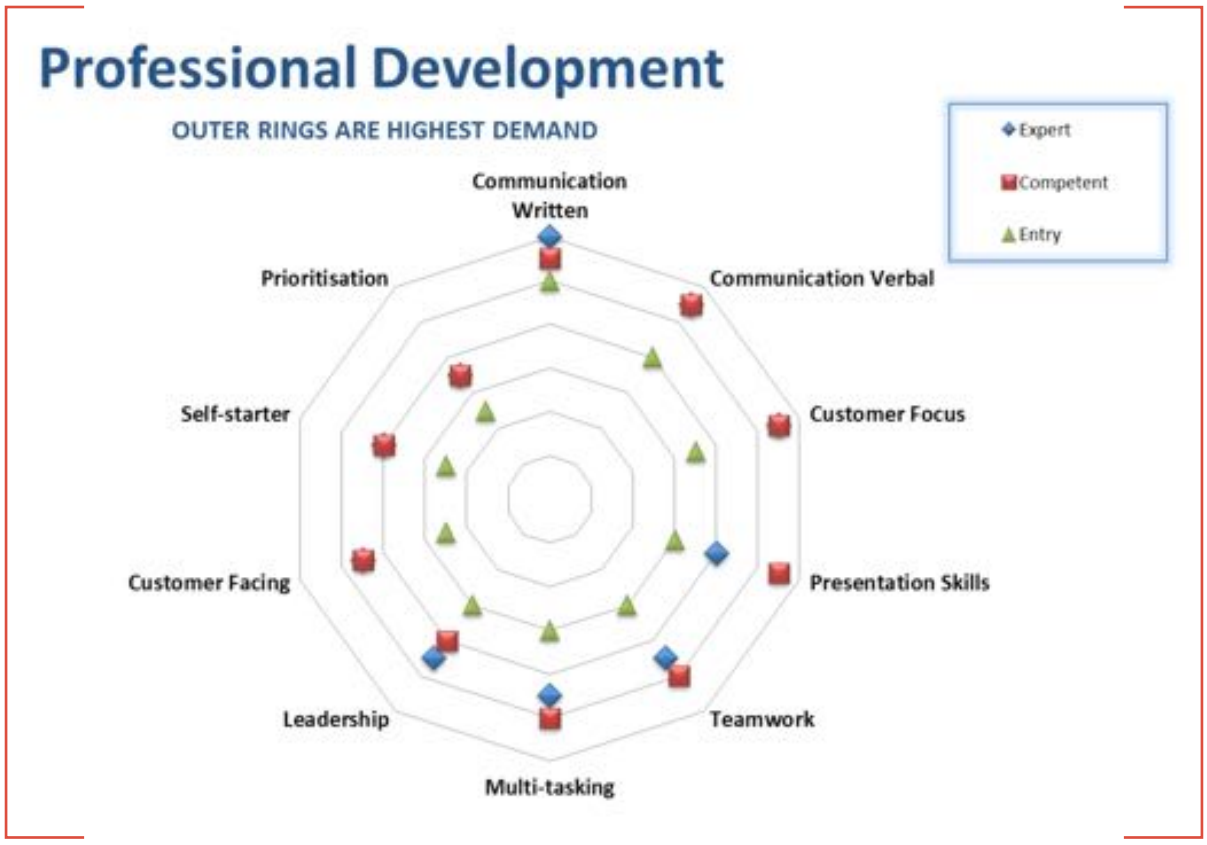


Highest Demand Ranked by Most Needed

Rank	Entry Level	Competent Level	Expert Level
1	Agile / Scrum / Kanban	Agile / Scrum / Kanban	Agile / Scrum / Kanban
2	Prince II	Prince II	Prince II
3	ITIL (Information Technology Infrastructure Library)	ITIL (Information Technology Infrastructure Library)	ITIL (Information Technology Infrastructure Library)
4	Experience in People Management	Experience in People Management	Experience in People Management
5	Microsoft Project	Experience in Strategic Planning	Experience in Strategic Planning
6	Experience in Strategic Planning	Microsoft Project	Microsoft Project
7	Experience in Project Management Capacity	Experience in Project Management Capacity	Experience in Project Management Capacity
8	PMP	PMP	PMP

DISCIPLINE B:

In the Professional Development sphere, employers' requirements are crystal clear. Communications skills, both written and verbal are the top demand, followed closely by Customer Focus, Presentation, Teamwork and Multi-tasking.



Highest Demand Ranked by Most Needed

Rank	Entry Level	Competent Level	Expert Level
1	Communication Written	Communication Written	Communication Written
2	Communication Verbal	Communication Verbal	Communication Verbal
3	Customer Focus	Customer Focus	Customer Focus
4	Presentation Skills	Presentation Skills	Teamwork
5	Teamwork	Teamwork	Multi-tasking
6	Multi-tasking	Multi-tasking	Leadership
7	Leadership	Customer Facing	Customer Facing
8	Customer Facing	Leadership	Presentation Skills

DISCIPLINE C:

In the Problem-Solving Skills domain, the stand out requirement at all levels was for Analytical Thinking Skills. This was further reinforced by the next most in-demand skills being Inventive, Critical, and Systems Thinking.



Highest Demand Ranked by Most Needed

Rank	Entry Level	Competent Level	Expert Level
1	Analytical Thinking Skills	Analytical Thinking Skills	Analytical Thinking Skills
2	Inventive Thinking Skills	Inventive Thinking Skills	Inventive Thinking Skills
3	Critical Thinking Skills	Critical Thinking Skills	Systems Thinking Skills
4	Systems Thinking Skills	Systems Thinking Skills	Critical Thinking Skills
5	Design of Experiments	Models Based Problem Solving	Models Based Problem Solving
6	Technical report writing	Root Cause Analysis	Root Cause Analysis
7	Root Cause Analysis	Design of Experiments	Design of Experiments
8	Models Based Problem Solving	Technical report writing	Technical report writing

6. Further Considerations

While the primary focus of this ICT Skills Audits is the ICT and tech related sectors, the findings have wider application across other sectors of the economy, for labour market policy, education, and training provision in general.

It might be of interest to readers, as a best-practice, to note that since the inception of FIT (1999), in Ireland, as an industry-led initiative that liaises with policy-makers and actively engages and collaborates with education and training providers, over 18,000 learners and job-seekers have participated in vocational training technology programmes up to Level 6 on the Irish Framework of Qualification (MQF 4). Of these, over 13,500 have secured quality employment in tech-related sectors to date. This impact may be an indicator about what might be achievable in Malta, in complement to existing provision, to enhance the indigenous tech talent pipeline and invokes the following reflections for consideration.

The technology sector is a more welcoming host than generally perceived, and keen to engage a wider array of skills, interests and competencies

The technology sector is widely associated with an aspiration to largely recruit graduates of STEM subjects (science, technology, engineering, and maths – particularly honours maths). Yet, this is far from a complete or accurate representation of its requirements or of the employment opportunities it has open. While there will be a continued strong requirement for academic achievers, the findings of this, and similar skills audits undertaken in recent years, suggest a much larger and growing requirement for technical acumen and application, enhanced by project management, employability and customer facing skills. The technology sector is, in fact, a much broader church than generally perceived, and its appetite for 'smart people with tech smarts' encompasses an eclectic range of talents and attributes, and indeed, personalities. It is an outdated typecast to regard the sector as chiefly requiring 'geniuses', or 'nerds', who relish spending long hours in front of computer screens, banging away on key-boards, doing 'heady' programming.

People with developed ICT skills are not just needed in the ICT sector itself, as more and more jobs require various levels of proficiency in tech skills. As ICTs permeate all sectors of the economy and society in general (3d Printers being used to create medical components, Virtual Reality supporting mechanical maintenance etc.), this trend is likely only to exacerbate as more companies apply and adapt the digital technologies to manage their activities, market

their products, communicate with their customers, increase productivity, etc. So it is almost an imperative that all job-seekers, as well as current employees, - even those who do not wish to become 'IT practitioners' – to hone their IT skills - as technology more profoundly impacts how we work and live, and which IoT technologies will further revolutionise over the next decade. The enhanced capacity emerging within the IoT paradigm will result in the emergence of new roles, skill-sets and careers paths yet to be defined across all sectors of the economy.

It is estimated that there will be in the region of 50 billion connected devices by the year 2020. The benefits created by such rapid advancements of IoT technologies are widely published, and focus on how it might make lives easier, while enhancing global productivity. Accordingly, it should be more widely appreciated what the technology sector provides today, and will create a multitude of different and interesting jobs, for both women and men – from the technically minded setting up and securing networks and infrastructure, to the arithmetically minded in building programmes and creating apps. Also, alongside the creative in the sphere of online media, marketing and design, with the 'people minded' building relationship in sales, customers support and indeed medical/welfare services, and the entrepreneurs forging ahead in e-Business, as well as the mechanics undertaking virtual diagnostics and repairs to our driverless cars.

Advanced economies are more dependent on workers with intermediate and entry-level skills

There is a wide awareness and consensus that the future course of economic development will entail a particularly strong growth in demand for high-skilled and professional workers. But it is important not to confuse rates of growth with absolute numbers, or to forget that many job openings arise from replacement demand as well as expansion demand. In developed economies, it is estimated that only one third of future job opportunities will be in high-skilled occupations, and in absolute terms, there will be significantly more job opportunities at lower levels of the skills ladder. Cedefop estimates that 65% of jobs in European economies will necessitate medium level skills (50%) or low level skills (15%) – with the rest requiring high level skills. Similar forecasts of tech-related skill-needs in US economy show that two-thirds of jobs will be in the mid-to-low skills range (Holzer & Lerman). As the Skills Audit indicates, there would seem to be globally a growing demand for workers, who are appropriately skilled and proficient to undertake introductory-level and middle-level positions in this fast evolving sector.

The widely held perception that advanced labour markets primarily require graduates is fast being discredited by the emerging demands of industry. Too great an emphasis on Higher Education as a pre-requisite to decent employment can cause many casualties - disappointed graduates who take jobs below their potential, resulting in demotivation and disillusionment, 'credentialism' where degrees are required to apply for jobs that do not need them, resulting loss of skills utilisation and under-employment, non-degree holders being overlooked on the labour ladder, downward pressures on standards in Higher Education and, perhaps, most

seriously of all, the assignment of 'second class status' to those who do not have a Higher Education despite the skills, knowledge and competencies attained, work track record or positive attitude.

It must also be noted that the minimum of skills, technical acumen and rigor, required for entry-level and intermediate skilled jobs, is not negligible, and is rising. This reinforces the view that some form of post-secondary education, or training, is now essential for every young person, and that to directly enter a job that does not involve training after completing the Second Level school, or its equivalent today, effectively constitutes 'early school-leaving'.

A larger proportion of the skill requirements of the Maltese economy can be catered through Further Education provision

Employers have a central role to play in ensuring that Further Education providers are aware of the specific skills that are in demand and of value in the workplace. At the same time, employers, Government, parents, students and, indeed, education providers in the public sector, need to be better informed and have greater confidence in the calibre and capacity of vocational education and training, to meet the high demands and expectations of industry.

There is a major need to boost and enhance Further Education provision at MQF Levels 3 and 4, by designing and delivering a wider course portfolio in closer consultation with employers, so that those school completers who are not advancing to Higher Education, acquire employment footholds in enterprises and sectors where there are good prospects of on-the-job learning and mobility.

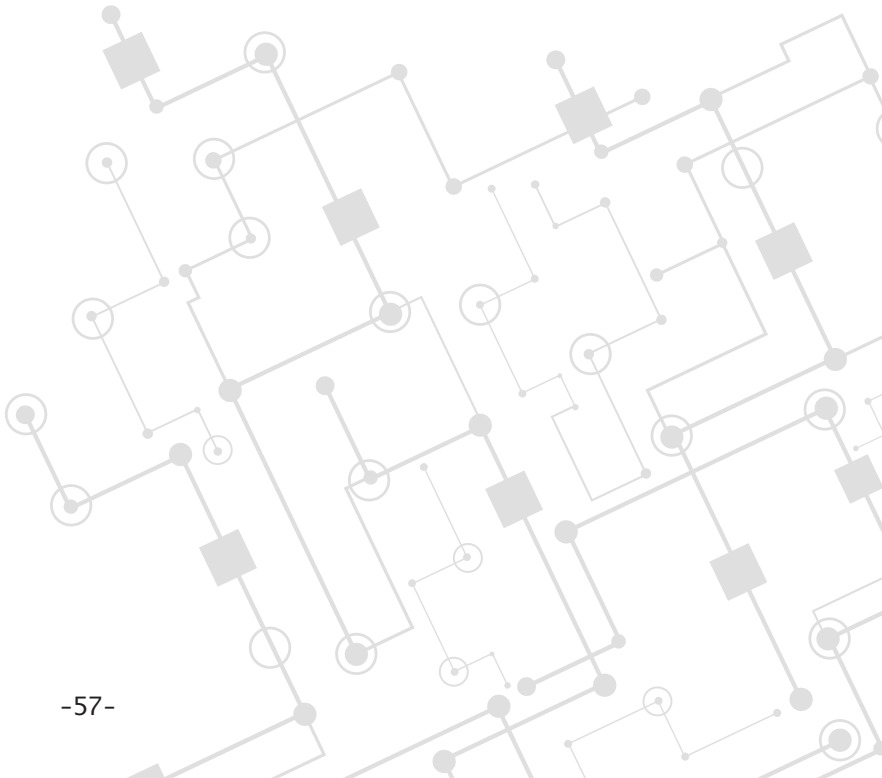
Educational Directorates tasked with the responsibility should seek to increase the number, variety and format of courses at this level, informed by strong employer involvement, to make sure that they correlate to real employment prospects for those who successfully complete the courses.

The status of vocational education merits elevation

The polarity that currently exists between Further Education and Higher Education, within tertiary education systems, generally needs to be challenged, and addressed. Influenced by Victorian perspectives on class and occupations, vocational education came to be more associated with exceptionally applied formats of learning, and given a lesser standing than abstract reasoning. However, all tertiary education is largely vocational, and the unifying goal across the continuum of Further Education and Higher Education is to impart the skills, knowledge and competencies necessary to participate in the economy, and prosper. The persistence of strong derision today between vocational and academic education, is historically

linked to the status of occupations in another era – outdated - the responsibility for reappraising and communicating the value awards attained within Further Education and Higher Education, lies equally with industry, as it does with educationalist and guidance professionals.

Today, it is widely acknowledged that people have different styles of learning, necessitating diverse learning paths through which each can develop their potential, and acquire in-demand knowledge and skills. Choosing vocational preparation, through Further Education after completing school, rather than Higher Education, can no longer be regarded as a lesser route that only 'weaker' students pursue. To this end, it is important that the Further Education and Higher Education 'pillars' cooperate in correcting negative, or distorted views of each other, and that academic achievement, learning-by-doing, vocational preparation and a welcome for each other's former students, is fostered in each sector. Only a successful partnership and shared future between Further Education and Higher Education will make sure the greatest number of learners, of diverse interests and capabilities, progress confidently across and through the educational system with ambition, and acquire the competencies and skills the economy requires, which bring shared prosperity to the community.



7. Concluding Remarks

The ICT sector is one of the most rapidly developing sectors of the Maltese economy. It is clear that the increase in IT companies in Malta is fuelling unprecedented demand for tech talent. The emergence of growing financial sector, and thriving gaming companies, is creating increased competition for particular skill-sets, such as systems development, cyber-security and marketing etc. This further compounds the digital skills shortage in Malta, and creates a 'candidate-driven' labour market. Digital jobs hurtled from 50% to 70% of all the vacancies in 2016, while salaries are reported to have increased by 10% to 15% in the same period, increasing pressure in overall competitiveness in the sector.

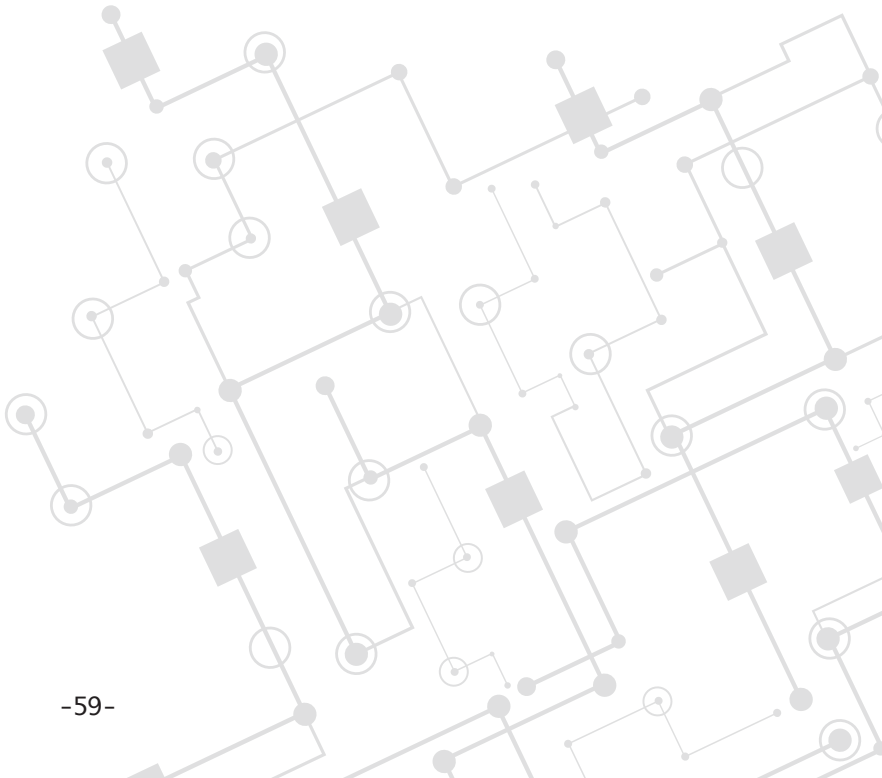
Existing and emerging skills shortages in key tech areas of the economy, if left unaddressed, could slow economic growth and curb further reductions in unemployment, as well as impede wider participation in the workforce. It is insufficient, and indeed unwise, for policymakers and industry to rely essentially on increasing the number of Higher Education graduates in the workforce to supply the skills that the economy will need. Accordingly, the courses and qualifications taken by young people and job-seekers across the continuum of tertiary education, that is Further Education and Higher Education provision, need to better match the requirements of employers and learners' needs for subsequent employment.

Addressing the skills agenda is receiving more intense debate both at home and abroad. There are predictions that the shortage of workers with technical skills could exceed 3.4 million, in the UK, by 2020, with multiples of that demand across Europe. Growth sectors such as pharmaceuticals, digital technology, advanced manufacturing and green technology in the leading global economies, are articulating a strong demand for mid-level technical skills, as opposed to general degree-level qualifications. This demand is for technicians who have vocational qualifications at MQF Level 3 upwards.

As evolutionary and revolutionary technologies emerge and are mainstreamed, they are continuously reformatting the needs and demands of the labour market, and consequently redefining the skills requirements. Over time, these once radical advances in technologies have resulted in the standardisation of some roles previously regarded as highly skilled.

Evidence of such evolution today can readily be seen in particular technologies such as web infrastructure, software development tools, and content management systems. At the same time, fresh technological advances kick-start new paths of deployment requiring new and varied skills sets across the qualifications spectrum.

eSkills Malta Foundation is of the view that the data presented in this skills audit has important implications for the Maltese education system, the tech sector, and the economy. There is little doubt that the jobs market in the technology, and similar knowledge-intensive exporting sectors, will continue to have a strong requirement for degree-holders. However, the 'human capital' demands of even these sectors, as evidenced in the skills audit, would appear to be much significantly broader and embraces people with a range of technical, as well as general skills, that can, in-part, be facilitated within Further Education provision, as within Higher Education.



eSkills Malta Foundation

fit The ICT Talent Pipeline

MALTA ICT SKILLS AUDIT 2017

Company Profile			
Company Name:			
Contact:			
Industrial Profile:	Indigeneous		FDI
Industrial Sector:			
Number of Employees in Malta			
Number of Employees in Local Facilitity (ies):			
Year Established:			

Discipline				
1	Programming / Development Methodologies	Existing Programming / Deb Staff	Areas Requiring Upskilling Supports - Insert U	Job Opportunities (recruitment in next 12 - 18 months)
No.	Skill	Expert	Competent	Entry
1	SQL			
2	Java			
3	JavaScript (Jquery)			
4	.Net (ASP.NET / VB.Net / C#)			
5	C++			
6	Objective C			
7	Python			
8	PHP			
9	Ruby on Rails			
10	Curl			
11	Delphi			
12	Eiffel			
13	IBM DB2			
14	Cobol			
15	Oracle ADF			
16	Windows Server and Windows Client Editions			
17	Go			
18	Team Foundation Server (TFS)			
19	iOS/Swift			
20	Project Management			
21	Problem Solving			
22	Professional Development (Soft Skills)			
23	Other Skill (Specify)			
24	Other Skill (Specify)			
25	Other Skill (Specify)			

Discipline				
2	Mobile Technology / Development Platform	Existing Mobile Technology / Dev Staff	Areas Requiring Upskilling Supports - Insert U	Job Opportunities (recruitment in next 12 - 18 months)
No.	Skill	Expert	Competent	Entry
1	Java			
2	JavaScript (jQuery)			
4	.Net (ASP.NET / VB.Net / C#)			
5	CSS			
6	HTML5			
7	Objective C			
8	iOS/Swift			
9	Phone Gap			
10	NativeScript			
11	React Native			
12	Xamarin			
13	Notable			
14	Slack			
15	Wordpress			
16	MailChimp			
17	Hangouts			
18	UX Design (HEART)			
19	Enterprise Mobile Management			
20	Wi-FI Standards (802.11ac)			
21	Long Term Evolution Technology (LTE and LTE-A)			
22	Project Management			
23	Problem Solving			
24	Professional Development (Soft Skills)			
25	Other Skill (Specify)			
26	Other Skill (Specify)			

Discipline				
3	Web Development / Technologies	Existing Web Development Staff	Areas Requiring Upskilling Supports - Insert U	Job Opportunities (recruitment in next 12 - 18 months)
No.	Skill	Expert	Competent	Entry
1	SQL			
2	MySQL			
3	Redis			
4	.Net (ASP.NET / VB.Net / C#)			
5	PHP / JSP			
6	Python (Django / Flask)			
7	Ruby (Rails / Sinatra			
8	Java			
9	Java Web Frameworks (Spring, Hibernate, JSF/JSP, REST, SOAP etc)			
10	Javascript (Jquery) (HTML5/CSS/JavaScript/Jquery/Angular JS/ Gulp)			
11	HTML5			
12	CSS			
13	Angular JS / Gulp			
14	Node.js (Express / Hapi)			
15	Go (Revel)			
16	Web API			
17	Wordpress			
18	Joomla			
19	Magento			
20	Motion UI			

21	Foundation for Apps (AngularJS + flexbox grid framework)			
22	Docker (Containers)			
23	React			
24	CMS			
25	Polymer			
26	Bootstrap			
27	Foundation			
28	MDL			
29	SASS			
30	LESS			
31	PstCSS			
32	Atom			
33	Visual Studio Code			
34	Giy			
35	Photoshop			
36	Dreamweaver			
37	Adobe EDGE			
38	ADO.Net			
39	Trackwise			
40	Project Management			
41	Problem Solving			
42	Professional Development (Soft Skills)			
43	Other Skill (Specify)			
44	Other Skill (Specify)			
45	Other Skill (Specify)			

Discipline				
4	**Software Development Tools and Methodologies**	**Existing S/D Tools and Methodologies Staff**	**Areas Requiring Upskilling Supports - Insert U**	**Job Opportunities (recruitment in next 12 - 18 months)**
No.	**Skill**	**Expert**	**Competent**	**Entry**
1	Agile (Crystal Methods, DSDM, Scrum)			
2	Exteme Programme (XP)			
3	Feature Driven Development (FDD)			
4	Joint Application Development			
5	Lean Development			
6	Rapid Application Development (RAD)			
7	Standard Revision Control (SVN) & Defect Tracking Tools (JIRA)			
8	Git			
9	Continuous Delivery			
10	Object Orientated Design & Development Tools			
11	Experience with Open Source Tools			
12	SDLC -Software Development Life Cycle			
13	OO Design using UML			
14	DB 2			
15	Bitbucket			
16	Bamboo			
17	Docker			
18	PROGRESS			
19	Software Testing			
20	Project Management			
21	Problem Solving			
22	Professional Development (Soft Skills)			
23	Other Skill (Specify)			
24	Other Skill (Specify)			
25	Other Skill (Specify)			

Discipline				
5	Cloud Computing	Existing Cloud Staff	Areas Requiring Upskilling Supports - Insert U	Job Opportunities (recruitment in next 12 - 18 months)
No.	Skill	Expert	Competent	Entry
1	Amazon Web Services			
2	Microsoft Cloud / Azure / Office 365			
3	MCSE Private Cloud			
4	MCSA Windows Server 08/12/16			
5	VMWare vCloud			
6	EMC Cloud Architect (EMCCA)			
7	Openstack Cloud			
8	Rackspace Public Cloud			
9	Comptia Cloud+			
10	CompTIA Network +			
11	Salesforce			
12	IBM SmartCloud Enterprise			
13	HP Enterprise Services			
14	MCSA: Windows Server			
15	MCSE: Private Cloud			
16	Certified Cloud Security Professional (CCSP)			
17	Microsoft SQL Server			
18	IBM Cloud Big Data			
19	Oracle Database			
20	MySQL			
21	Hadoop			
22	Mongo DB			
23	Support Engineer (Linux - Redhat, Debian, Ubuntu)			
24	Exposure to Shell/Perl/Python/PHP scripting			
25	CloudSigma			
26	WorkXpress			
27	Google Compute Engine			
28	Sphere			
29	Web Services SOAP, REST			
30	HyperV			
31	Docker			
32	NGINX			
33	Project Management			
34	Problem Solving			
35	Professional Development (Soft Skills)			
36	Other Skill (Specify)			
37	Other Skill (Specify)			

Discipline				
6	Platform Administration	Existing Platform Staff	Areas Requiring Upskilling Supports - Insert U	Job Opportunities (recruitment in next 12 - 18 months)
No.	Skill	Expert	Competent	Entry
1	MCSE Cloud Platform and Infrastructure			
2	MCSE Server Infrastructure			
3	MCSE Private Cloud			
4	MCSA Windows Server 08/12/16			
5	Managing Microsoft SharePoint Server 2016			
6	Exchange Server Rollout and Administration			
7	Microsoft Hyper-V			
8	Microsoft Cloud / Azure / Office 365			
9	Enabling Office 365 Services			

10	VMWare vCloud			
11	PowerShell - DSC			
12	Linux LPIC1 / LPIC 2			
13	Linux Foundation Certified System Administrator (LFCS)			
14	Support Engineer (Linux - Redhat, Debian, Ubuntu, Mint)			
15	Comptia Linux+			
16	Comptia Server +			
17	VBScript/PowerShell/C# scripting			
18	Information Technology Infrastructure Library (ITIL)			
19	OpenStack			
20	Cloudstack			
21	Analytical / Quantitative Skilss			
22	Leadership Skills			
24	Project Management			
25	Problem Solving Skills			
26	Professional Development (Soft Skills)			
27	Other Skill (Specify)			
28	Other Skill (Specify)			
29	Other Skill (Specify)			

Discipline				
7	**DevOps**	**Existing DevOps Staff**	**Areas Requiring Upskilling Supports - Insert U**	**Job Opportunities (recruitment in next 12 - 18 months)**
No.	**Skill**	**Expert**	**Competent**	**Entry**
1	MCSE Cloud Platform and Infrastructure			
2	MCSE Server Infrastructure			
3	MCSA Windows Server 08/12/16			
4	Microsoft Team Foundation Server			
5	Linux Foundation Certified System Administrator (LFCS)			
6	Microsoft Hyper-V			
7	Vmware vCloud			
8	Kernel-based Virtual Machine (KVM)			
9	Cisco CCNA Data			
10	OpenStack			
11	Cloudstack			
12	Chef			
13	Docker			
14	Powershell			
15	Perl			
16	Ruby			
17	JavaScript (Jquery)			
18	Code to RESTFUL APIs			
20	C++			
21	.Net (ASP.NET / VB.Net / C#)			
22	ASP			
23	Chef			
24	Puppet			
25	Ansible			
26	Vagrant			
27	CFEngine			
28	GIT			
29	Visual Studio Online			
30	Microsoft Azure			
31	Amazon Web Services			
32	CruiseControl (.NET)			
33	Jenkins			
34	Cucumber			
35	Bamboo			

36	Hudson			
37	ThoughtWorks' Go			
38	Nunin			
39	Cloudwatch			
41	Project Management			
42	Problem Solving			
43	Professional Development (Soft Skills)			
44	Other Skill (Specify)			
45	Other Skill (Specify)			
46	Other Skill (Specify)			

Discipline				
8	**Networking Technologies**	**Existing Net Tech Staff**	**Areas Requiring Upskilling Supports - Insert U**	**Job Opportunities (recruitment in next 12 - 18 months)**
No.	Skill	Expert	Competent	Entry
1	Cisco Certified Internetwork Expert (CCIE)			
2	CISCO Cisco Certified Network Administrator - CCNA			
3	Cisco Certified Network Professional– CCNP			
4	MCSA Windows Server 16/12/08			
5	MCSE Server Infrastructure 2012			
6	VMWareCertified Associate – Network Virtualizatio			
7	VMware VCP6-DCV			
8	AWS Certified Solutions Architect – Associate			
9	IP Networking			
10	CompTIA Network+			
11	Comptia A+ Certification			
12	Comptia Linux+			
13	CWNP Certification (Wireless Networks)			
14	Certified Information Systems Security Professional (CISSP)			
15	Juniper Networks Certified Internet Associate			
16	Citrix			
17	WCNA: Wireshark Certified Network Analyst.			
18	Network Security			
19	Wireless Networking			
20	Certified in Risk and Information Systems Control(CRISC)			
21	SNIA Certified Storage Network Expert			
22	Certified Wireless Networking Professional			
23	Digital Rights Management			
24	Project Management			
25	Problem Solving			
26	Professional Development (Soft Skills)			
27	Other Skill (Specify)			
28	Other Skill (Specify)			
29	Other Skill (Specify)			

Discipline				
9	**Big Data**	**Existing Big Data Staff**	**Areas Requiring Upskilling Supports - Insert U**	**Job Opportunities (recruitment in next 12 - 18 months)**
No.	**Skill**	**Expert**	**Competent**	**Entry**
1	Apache Hadoop			
2	Apache Spark			
3	NoSQL			
4	MongoDB			
5	Couchbase			
6	SQL			

7	Java			
8	C			
9	Python			
10	Scala			
11	JavaScript			
12	Linux			
13	Systems Architecture			
14	Systems Administraton			
15	Network Adminstration			
16	Vmware			
17	Microsoft Azure			
18	IBM Cloud Big Data			
19	IBM DB 2			
20	Oracle			
21	SAP HANA			
22	Machine Learning / Data Mining			
23	Stastical Analysis (SAS, SPSS, Strata, Matlab, R)			
24	Problem Solving			
25	Project Management			
26	Problem Solving			
27	Professional Development (Soft Skills)			
29	Other Skill (Specify)			
30	Other Skill (Specify)			
31	Other Skill (Specify)			

Discipline				
10	**ENTERPRISE APPLICATIONS**	**Existing Enterprise Applications Staff**	**Areas Requiring Upskilling Supports - Insert U**	**Job Opportunities (recruitment in next 12 - 18 months)**
No.	**Skill**	**Expert**	**Competent**	**Entry**
1	SQL			
2	MySQL			
3	MCSA SQL 16/14/12			
4	MCSE Data Platform			
5	IBM DB2			
6	IBM Enterprise Applications			
7	IBM Cognos			
8	NoSQL			
9	SAP HANA			
10	SAP Enterprise Information Management (EIM) Solutions			
11	SAP Enterprise Resource Planning (ERP)			
12	Oracle ERP			
13	Salesforce			
14	PeopleSoft			
15	Dynamics CRM			
16	Sureskills			
17	WORKDAY			
18	VMware VEEAM			
19	WorkWise			
20	Knowledge of Data-base Design			
21	Sugar CRM			
22	MS Access/Excel			
23	SharePoint			
24	Hana			
25	TrackWise			
26	Project Management			
27	Problem Solving			
28	Professional Development (Soft Skills)			

30	Other Skill (Specify)			
31	Other Skill (Specify)			
32	Other Skill (Specify)			

Discipline				
11	**eBusiness / Digital Marketing**	**Existing eBus / Digital Marketing Staff**	**Areas Requiring Upskilling Supports - Insert U**	**Job Opportunities (recruitment in next 12 - 18 months)**
No.	Skill	Expert	Competent	Entry
1	Search Engine Optimisation (SEO)			
2	Google Keyword Planner			
3	Open Site Explorer			
4	Ahrefs			
5	Search Behaviour Tools (Moz, SEMRush etc.)			
6	SEM - Pay Per Click (Google Adwords etc)			
7	***Content Management (CMS)***			
8	WordPress			
9	Joomla			
10	ocPortal			
11	Drupal			
12	***Customer Relationship Management (CRM)***			
13	Salesforce			
14	Oracle			
15	SAP Enterprise Information Management (EIM) Solutions			
16	Dynamics CRM			
17	***Analytics / Performance***			
18	Google Analytics			
19	Facebook Insights			
20	Twitter Analytics			
21	Teradata's Marketing Operations			
22	HootSuite			
23	Performance			
24	***Email Marketing***			
25	MailChimo			
26	iContact			
27	Salesforce Marketing Cloud			
28	Maketo			
29	Social Media Marketing / Planning (Facebook, Linkedin, Twitter etc)			
30	Social Media Monitoring / Blogging (Online PR & Communications)			
31	***Viral Marketing***			
32	Buzzfeed			
33	Upworthy			
34	ViralNova			
35	***E – commerce***			
36	Digital Display Advertising			
37	Affiliate Marketing			
38	Planning and Implementing a Digital Marketing Strategy			
39	Lead Nurturing (B2B)			
40	UX Design			
41	Slideshare			
42	Adobe Photoshop			
43	Adobe Illustrator			
44	***Coding***			
45	HTML5			
46	CSS			
47	Project Management			
48	Problem Solving			
49	Professional Development (Soft Skills)			

51	Other Skill (Specify)			
52	Other Skill (Specify)			
53	Other Skill (Specify)			

Discipline				
12	**Call Centre/Contact Centre Support**	**Existing Call Centre Staff**	**Areas Requiring Upskilling Supports - Insert U**	**Job Opportunities (recruitment in next 12 - 18 months)**
No.	**Skill**	**Expert**	**Competent**	**Entry**
1	Proficient in relevant Computer Applications			
2	Knowledge of Customer Service Principles & Practices			
3	Knowledge of Call Centre Telephony & Technology			
4	Customer Service Experience			
5	Good Data Entry/Keyboard Skills			
6	Knowledge of Administration & Clerical Processes			
7	Relevant Product Knowledge			
8	Appreciation of E-Commerce / Cloud Technologies			
9	Contact Centre Metrics			
10	Project Management			
11	Problem Solving			
12	Professional Development (Soft Skills)			
13	Customer Facing			
14	Other Skill (Specify)			
15	Other Skill (Specify)			
16	Other Skill (Specify)			

Discipline				
13	**Digital Skills / Media**	**Existing Creative Media Staff**	**Areas Requiring Upskilling Supports - Insert U**	**Job Opportunities (recruitment in next 12 - 18 months)**
No.	**Skill**	**Expert**	**Competent**	**Entry**
1	Object Orientated Design			
2	Bootstrap			
3	JavaScript (Jquery)			
4	Angular			
5	Code Igniter			
6	PHP			
7	CSS			
8	HTML5			
9	MySQL			
10	Wordpress			
11	Joomla			
12	Magento			
13	Motion UI			
14	Docker			
15	Atomic			
16	Ceros			
17	Protosketch			
18	Floid			
19	Vectr			
20	Fuse			
21	Picktorial			
22	Figma			
23	Uxpin			
24	Gravit			
25	AdobeCreative Cloud			
26	Photoshop CC			
27	Illustrator CC			

28	Pixelmator			
29	Skitch			
30	Coda 2			
31	InDesign CC			
32	Sublime Text			
33	Framer.js			
34	3D animation			
35	3DLive			
36	MXRToolkit			
37	ARToolkit			
38	flARToolkit			
39	Silverlight			
40	Papervision 3D			
41	InDesign			
42	Illustrator			
43	Firework			
44	After Affects			
45	Project Management			
46	Problem Solving			
47	Professional Development (Soft Skills)			
48	Other Skill (Specify)			
49	Other Skill (Specify)			
50	Other Skill (Specify)			

Discipline				
14	**Games Development**	**Existing Games Development Staff**	**Areas Requiring Upskilling Supports - Insert U**	**Job Opportunities (recruitment in next 12 - 18 months)**
No.	**Skill**	**Expert**	**Competent**	**Entry**
1	Unity / Unity Mobile			
2	Unreal Developmetn Kit			
3	Yebis			
4	Cloudant			
5	Marmalade			
6	GameSparks			
7	GameMaker			
8	GameSalad			
9	FMOD			
10	Edgelib			
11	CryEngine			
12	Coroan SDK			
13	ShiVa3d			
14	MoSysn			
15	OpenGame Art			
16	Blender			
17	Game State Management (GSM)			
18	Object Orientated Development			
19	3D Graphics Theory			
20	Game Logic & Design			
21	HTML5/CSS/JavaScript/Jquery			
22	Web-based Architectures & Technologies (REST, XML, JSON).			
23	.Net (ASP.NET / VB.Net / C#)			
24	C++			
25	Java			
27	MEL			
28	Unity			
29	Project Management			
30	Problem Solving			

31	Professional Development (Soft Skills)			
33	Other Skill (Specify)			
34	Other Skill (Specify)			
35	Other Skill (Specify)			

Discipline				
A	**Project Management**	**Existing PM Staff**	**Areas Requiring Upskilling Supports - Insert U**	**Job Opportunities (recruitment in next 12 - 18 months)**
No.	**Skill**	**Expert**	**Competent**	**Entry**
1	Prince II			
2	Agile / Scrum / Kanban			
3	IBM DevOps			
4	Six Sigma / Lean			
	PMI Project Management Professional			
5	ITIL (Information Technology Infrastructure Library)			
6	Experience in Project Management Capacity			
7	Experience in People Management			
8	Experience in Strategic Planning			
9	PMP			
10	Comptia Project +			
11	Teamwork.com			
12	Basecamp			
13	Slack			
14	Microsoft Project			
15	Other Skill (Specify)			
16	Other Skill (Specify)			
17	Other Skill (Specify)			

Discipline				
C	**Problem Solving Skills**			
1	Design of Experiments			
2	Critical Thinking Skills			
3	Analytical Thinking Skills			
4	Inventive Thinking Skills			
5	Systems Thinking Skills			
6	Models Based Problem Solving			
7	Kepner-Tregoe			
8	7 Step Problem Solving			
9	Technical report writing			
10	Task Force Leadership			
11	Knowledge Management Skills			
12	Root Cause Analysis			
17	Other Skill (Specify)			
18	Other Skill (Specify)			
19	Other Skill (Specify)			

Discipline				
B	**Professional Development**			
1	Communication Verbal			
2	Communication Written			
3	Presentation Skills			
4	Leadership			
5	Customer Focus			
6	Self-starter			
7	Teamwork			
8	Multi-tasking			
9	Prioritisation			

12	Customer Facing			
13	Other Skill (Specify)			
14	Other Skill (Specify)			
15	Other Skill (Specify)			

Job Specs /Vacancies most difficult to fill?				
1				
2				
3				
4				
5				

	Other Recruitment Needs	Existing Staff	Areas Requiring Reskilling Supports - insert R Upskilling Supports insert U	Job Opportunities (recruitment in next 12 - 18 months)
		Expert	Competent	Entry
1	CRM/MIS			
2	Sales			
3	Marketing			
4	Finance			
5	IT			
6	Legal			
7	R & D			
8	Business Development			
9	General Operations			

10	Other			

	Addressing Skill Needs			
	1. From what IT Programmes do you courrently source candidates?			
	2. Are you satisified with the calbire of the candidates you source from such IT Programmes?			
	3. Are you satisified with the quanity of candidaes you can source from such programmes?			
	4. Have you any recommendations on how such IT Progammes might better address your skill requrrements?			
			No	**Yes**
	5. Do you experience any barriers to developing skills within your organisation ?	Time		
		Cost		
		Skills Needs Analysis		
		Knowledge / Access to Training Provision		
		Other		
	6. Does your organisation have a requirement for languages?		**No**	**Yes**
		Basic	**Intermediate**	**Fluent**
	6a. What languages does your organisation require and at what level?			
	6b. Do you foresee additional language requirements within the next three years?		**No**	**Yes**
		Basic	**Intermediate**	**Fluent**

Supporting Questions			
Does the Company avail of Government Programmes?		No	Yes
Key request to Government on the Skills Agenda?			
Key request to Government re: doing business in Malta?			

Would the company support the introduction of dual-education initiative 'apprenticeship-style programmes as a complement to existing provision?

Other Comments

Questionnaire Key:

1. Use the table below to identify the additional skills you would like to have available (at a given competence level) in your organisation (e.g. a figure of 2 in the "Expert" column, and 1 in the "Entry" column for Java Programming, indicates that you would like to have two additional "units of skill" in your organisation at expert level, and one at entry level in Java Programming). Note: A "unit of skill" is not necessarily a new employee, as each employee will have more than one skill.

2. You are also asked to say how many staff you have already in this discipline and how many potential vacancies you may have in the next 12 - 18 months (e.g. a figure of 2 in the "existing Core Programming Skills" and 1 in "Job Opportunities" indicates that you already have 2 programmers but may have a vacancy for a third.)

Note: All information is treated with the strictest confidence and no respondent (or organisation) will be individually identified but participating companies will be acknowledged in a general list of contributors.



eskills.org.mt



/ESkillsMalta



@DigitalSkillsMT

eSkills Malta Foundation
Gattard House, National Road
Blata l-Bajda HMR 9010