FIT Submission to the Joint Committee on Education and Skills.

20th November 2018

1. INTRODUCTION

FIT welcomes this opportunity to contribute to the Committee's review of how apprenticeships and traineeships are being developed at this period in Ireland's social and economic development. FIT is a not-for-profit, industry-led organisation whose mission is to promote the inclusiveness of Ireland's rapidly expanding high tech sectors by enabling resident unemployed jobseekers acquire IT skill sets for which there is a demonstrated demand.

2. BACKGROUND TO FIT

It was established in 1999 to test and prove the shared convictions of people in industry and of education and training providers that sectors and occupations intensive in their use of IT skills present more opportunities than threats to jobseekers in Ireland, that high tech enterprises are not and do not wish to exclude those without a higher education, and that appropriately designed FET has a significant contribution to make in supplying the skill needs of these enterprises and making IT employment more inclusive. The fact that, 20 years on, high tech employers' support for FIT's mission continues strongly and that policy makers and that public bodies have become immensely more supportive of it, show that its founding convictions have stood the test of time.

However, it is still not appreciated sufficiently, and certainly not communicated vigorously enough to jobseekers in Ireland, the extent to which high tech employers are keen to broaden their intake of employees and to help design and support FET programmes for doing so. They are keen for a number of reasons;

- the sheer speed of change in the technologies they must employ makes them value the ability of new recruits to 'hit the ground running' and whose training incorporated substantial elements of learning-by-doing;
- the huge diversity of their customers makes them, in turn, value diversity in their workforces, including in socio-economic background and gender;
- the large scale of their skill needs, intensification of the 'global war for talent' and difficulties in maintaining Ireland's strong performance in attracting talent from abroad have sharpened their interest in additional channels of domestic recruitment and up-skilling existing employees;
- the ambition has grown among high tech employers, globally and in Ireland, to become more proactive in reducing inequalities, especially those being accentuated by the socially and regional uneven uptake of ICT opportunities, and promoting equity and inclusiveness; and
- employers and organisations seeking to recruit IT workers can now be found in every sector of the economy - the public, not-for-profit and private sectors, indigenous companies and SMEs, regions without large cities, agri-food and tourism, etc., now want their shares of learners leaving programmes with practical and up-to-date IT skill sets.

In short, it is FIT's experience that, where IT skills are in demand, employers value competencies more than credentials.

FIT is now the appointed Coordinating Provider for Ireland's first two ICT Apprenticeships to produce ICT Associate Professionals in Software Development and Network Engineering respectively. Our goal is to achieve an annual intake of 1,000 apprentices *per annum* by 2021. But this is a relatively recent development in FIT's history. In fact, over the last 20 years, FIT in collaboration with FÁS and VECs and, latterly ETBs, has facilitated 18,500 job seekers to access quality ICT training of which over 14,000 have secured employment. And, for the most part, the profile of these candidates does not mirror the stereo-typical depiction of those who are employed in high tech as being predominantly Third Level students who studied STEM subjects at a high level.

Some of the organisations major steps along the way help explain how the consortia of which it is a part has been accorded this responsibility and, indeed, honour.

3. SOME OF THE EXPERIENCE FIT BRINGS TO THE APPRENTICEHIP CHALLNGE

3.1 FIT has retained and strengthened its traction with tech sector employers by improving its understanding of their actual skills needs in a structured and on-going manner and then designing and arranging the delivery of tech courses in response. In 2012, it undertook its first independent, comprehensive and granular *FIT ICT Skills Audit* at a national level to get information from high tech employers that was more detailed, current and specific than it could source elsewhere and which it needed to inform its work. It has improved and repeated the process in 2014 and 2018. These Audits rely on face-to-face interviews with senior personnel in a position to confirm the actual disciplines in which they are seeking to recruit employees and whether the vacancies in question require skills to be exercised at entry-level, competent or expert levels. Feedback from tech sector companies and FET providers on the methodology and findings of these Audits has been overwhelmingly positive and spurred many companies to review the manner of their talent acquisition in a more holistic and inclusive manner and ETBs to increase the provision of FIT-supported IT courses.

3.2 In its ICT Skills Audit in 2014, at the end of each face-to-face interview, FIT asked respondent companies whether they would they be interested to support a dual-education 'apprenticeship style' FET training programme whose candidates on completion would hold a NFQ Level 6 Award in either Software Development or Network Engineering. An overwhelmingly 85% of the respondent companies said yes and welcomed the initiative. In response the following year, with the support of the Department of Education and Skills, SOLAS and 8 participating ETBs (CDETB, CETB, CMETB, DDLETB, GRETB, LCETB, LMETB, LWETB), FIT rolled out a new dual education, two year training programme called *ICT Associate Professional* at NFQ Level 6 (FET). During this pilot, 143 tech companies ranging from prominent multinationals to SME's sponsored 259 candidates and in excess of 80% of participants securing quality employment. An independent evaluation of the programme carried out by the CIRCA group found that the majority of company sponsors viewed their recruits from the programme as highly productive by their 12th month in the programme.

3.3 In 2016, FIT entered discussions with Intel regarding the potential of an NFQ Level 6 FET Award to augment their recruitment. The company responded enthusiastically and, over a six month period, the appropriate training content necessary to initiate a new Advanced Manufacturing Maintenance Technician programme was teased out. The process gave Intel the opportunity to better appreciate what FET provision could deliver and the first course commenced later that year with the collaboration and support of KWETB. 80% of the participants secured employment in Intel on completion and a further 10% secured employment elsewhere. Notably, the first candidate from the programme to secure employment in Intel was a lone-parent who had no previous knowledge or experience. In its recruitment messaging now, Intel clearly cites NFQ Level 6 Award as a desired level of certification for employment. With the support of KWETB, the capacity of the programme has since been doubled.

3.4 A final important piece of learning that convinced FIT to lead a consortium and apply to run IT apprenticeships was its realisation that appropriately designed high quality, employer-endorsed programmes require the investment of significant resources but yield their returns over years and constitute excellent value-for-money. This happens when trainees remain in sustained employment because they and their employers are satisfied. It is a hall mark of FIT programmes that the relevance of their content is endorsed and periodically reviewed by employers, the motivation of learners and their aptitudes assessed prior to beginning, the need for support monitored in-programme, pre-employment preparation provided, and in-work support maintained on beginning a job. In short, FIT has steadily sought to ensure the 'loop was closed' between beginning one of its programmes and maintaining good employment.

On the basis of its experience and the extent of the deep collaboration and strong relationships FIT had developed with ETBs, ETBI, SOLAS and the DES, the organisation responded to the apprenticeship call in 2016 and was appointed the Coordinating Provider for two ICT Apprenticeships. In time expanding this portfolio to include IT apprenticeships in complementary areas such as Cyber Security, Fin-Tech, DevOps, Virtualisation and Digital Forensics, FIT has set itself the goal of achieving an annual intake of 1,000 apprentices by 2021.

4. OBSERVATIONS ON THE WIDER CONTEXT TO IRELAND'S APPRENTICESHIP AMBITIONS

Some observations need to be made about the current international and wider national contexts to the decision to increase the number of apprenticeships and traineeships and extend them into sectors of that economy that have not traditionally had them.

4.1 An international re-evaluation of FET dual education[1]

Ireland is far being alone in seeking to upgrade its appreciation of the strength of demand in advanced economies for workers with the skill sets that dual education programmes,

---

[1] Studies on which this sub-section and the following are based are referenced in FIT's submission to the DES on the preparation of the National Skills Strategy – available on request from FIT.

including apprenticeships and traineeships can provide. In many OECD countries, perceptions of the proportions of jobs that need to be filled that require a four year degree or more have been or are being revised, even as living standards rise and economies become more knowledge-intensive. For example, in the US, it is estimated that one third of all vacancies by 2018 will call for some post-secondary qualification, but not necessarily the completion of a four-year degree, while two-thirds of overall employment growth in the European Union (EU25) is forecast to be in the "technicians and associate professionals" category, i.e., for professional and technical jobs requiring no more than one or two years of career preparation beyond upper secondary level category. (There is an extensive literature on this – a prominent source is the set of Skills Beyond School studies of the OECD and studies by the EU's Cedefop).

While some countries have thriving post-secondary vocational sectors (Germany and Switzerland being the oft-quoted European case studies), more have found it difficult to find a place for shorter (one-or two-year) programmes in competition with better known academic qualifications, and Ireland is a good example. While school and higher education, and the well-trod path between them, play a dominant role in how young people and parents target quality jobs as the Irish economy moves up the value chain, there is a corresponding under appreciation that, as an OECD report puts it, 'outside these two institutions there exists a less well understood world of colleges, diplomas, certificates and professional examinations – the world of post-secondary vocational education and training'. It has been, been pithily analysed in both the US and UK that they produce too many generalist bachelor's degrees, too many low-level vocational qualifications and too few higher technician or associate professional level qualifications. Even leading educational systems are being encouraged to critically review how they are ensuring that all their students, particularly those from disadvantaged backgrounds, are equipped with the necessary cognitive and social-emotional skills to make them resilient to technological change (e.g., Finland in the 2018 World Bank Report on the EU, Growing United. Upgrading Europe's Convergence Machine).

4.2 A difficult national climate in which to improve the status of FET

There are many reasons why young people in Ireland, backed by their parents, have an exceptionally strong preference to transfer to higher education immediately after completing the Leaving Certificate. They include:

- The employment rate advantage, the 'graduate premium' in earnings and the private financial returns to a tertiary education in Ireland are among the highest in the OECD (OECD, 2015);
- Unchallenged assumptions that within a decade or more, all good jobs will be for graduates;
- The underdevelopment of quality FET programmes that are alternative routes to good employment; and
- the limited access to good, labour market-informed career guidance on the part of those who need it most.

At the same time there are indicators that a growing number of graduates are being disappointed by what their higher education achieves for them. For example:

- The numbers of graduates in non-graduate elementary jobs and on low pay are high by international standards;
- The inequality in earnings among those with a higher education in Ireland is high by OECD standards;
- The proportion of people at work over-qualified for their jobs is high;
- The quality of the undergraduate experience has come under enormous pressure as staff-student ratios and undergraduates' contact hours with teaching faculty have fallen;
- Non-completion rates are high in parts of the HE sector;
- The job-readiness of graduates is of significant concern to many employers who are having recourse to sometimes quite long in-house graduate placement programmes.

Young people can feel defined by their Leaving Cert results and relative success in the 'points race' can have inordinate influence on the decision to proceed immediately to higher education and on what is studied. In FIT's experience of promoting the capacity of FET programmes as a complement to HE provision for the tech and related sectors, it is often not employers who need persuading of the credentials and competencies attained on FET vocational programmes but potential participants themselves, along with their parents, who have to be convinced that there is nothing '*second-class*' in choosing FET.

At the same time, many of those who gain only low CAO points can enter adult life more conscious of what they do not have than of what they have. FIT is profoundly aware of a 'waste of talent' among all too many of the 30%-40% of young people currently not transferring from school to higher education. At a time of life when self-confidence should abound, some finish their schooling with little sense of achievement and low self-belief, which can lead to the dilution of their career aspirations and disregard of their potential. It is significant that some of the countries from which many EU workers come to Ireland have educational systems more equitable than Ireland's (Estonia, Poland, and Latvia).

Overall, FIT continues to contend with what it sees as still a general undervaluing in Ireland society of FET provision and an underestimate of its capacity to equip job seekers, young and old, with skills that will be sufficient to secure quality employment in Ireland's already advanced economy. In particular, I want to highlight the labour market currency of the NFQ Level 6 FE Award – which I call Ireland's '*forgotten certification'*. It is, it should be noted, higher than an Honours Leaving Cert., at the same level as an Advanced Certificate or Diploma and equates to many industry / vendor certifications that are sought after by high tech companies. It is our experience that more and more of the tech companies who value competencies above credentials are becoming aware of the potential of a NFQ Level 6 FE Award holder to 'hit the ground running' and provide them with skills they need.

FIT wishes to state very clearly, therefore, that the belief that the lions' share of IT jobs to be filled require a higher education qualification is still too widely held and that it is simply wrong and misleading. FIT believes young people now are transferring directly to higher education from school whose aspirations, more beneficial patterns of learning and immediate employment prospects would be better served if they could enter quality, occupation-focussed FET programmes and defer their commencement of third level education in tandem with their career development. It is important that pressures on young people to seek entry to HE immediately are lessened by the greater provision of quality alternatives for gaining good employment at Levels 5-6 that include clear pathways HE at a later stage.

A more profound discussion than has yet been had, is still needed between educationalists and the corporate sector to ensure they understand together the full breadth of competencies and skills needed to underpin working lives in the future. It is then for early, primary and secondary education in Ireland to embrace and nurture all young people with their different talents, interests and intelligences by providing the learning styles that suit them and the requisite diversity of opportunities on leaving school to make promising starts to their working lives.

5. THERE IS STRONG DEMAND FOR IT SKILLS IN IRELAND

Many indicators point to a strong growth in demand for ICT practitioner skills in Ireland. For example:

- A study recently commissioned by DBEI as part of its preparation for Ireland's *Third ICT Skills Action Plan, 2018-2026* predicts that the demand for ICT skills in Ireland will continue to grow at a compound annual growth rate (CAGR) of 8.5%. This implies an additional 38,560 ICT practitioner jobs will be needed by 2022 alone;
- Employment survey results indicated that IDA Ireland ICT-related client firms' full-time employment grew by 8.4% in 2016, while employment in Enterprise Ireland ICT-related client firms grew by 9%;
- Demand for ICT practitioners is, in part, being met through attracting talent not just from across the EU but from beyond it. In 2017, 3,442 employment permits were issued —an increase of 8.2% on 2016 and of more than 35% on 2015;
- Demand for ICT practitioners on the part of indigenous firms and organisations (including public bodies) is likely to grow rapidly because of the major potential of the emerging new IT technologies to improve competitiveness and/or the quality of performance and services. Some of these companies and sectors play particularly important roles in the regions and are most vulnerable if they do not utilise ICTs to innovate, boost their productivity, and develop new market channels.

FIT's own Skills Audit 2018[2] painted a similar picture of a thriving tech sector requiring large numbers of additional ICT practitioners at entry, competent and expert levels. Its principal findings include:

---

[2] A copy will be forwarded to any committee member on request.

- Its estimate that there are 12,000 *current* vacancies for ICT practitioners, the majority of which (58%) require the exercise of skills at the entry or competent level, and the remainder (42%) at the expert level;
- Striking evidence of how the pace of technological change is affecting IT vacancies - consultation with employers in preparing its questionnaire found it necessary to add two new disciplines and 70 new specific skills to the framework that had been developed for the 2014 Audit;
- Good news on apprenticeships - 91% of respondents expressed support for apprenticeships and were willing to hire an apprentice to address skills shortages in their organisation.
- A deep challenge to the design of programmes - ICT companies continue to demand deeper technical skills, coupled with an increasing requirement for broad transversal skills to enable wider applications of emerging technologies. This is consistent with the conclusion of industry analysts that the "4th Industrial Revolution" is upon us, and that successful economies going forward will be characterised by their willingness and ability to adapt rapidly to the challenges and opportunities that this presents;
- Findings from complementary research carried out by FIT into the regional spread of IT employment in Ireland finds that
  - ICT activity and urban scale are closely linked – 38,300 or 45% of all ICT practitioners in the State are in the greater Dublin region. In addition to Dublin and the Mid-East, the South West can be described as having a significant cluster of ICT practitioners (11,400 or 13.4% of all in the State)
  - Yet the tech sector still has a significant degree of regional spread. What are small numbers in the national context can be significant in a regional and local context.
  - The scale of the current imbalance between Dublin and the other regions can be seen as an opportunity rather than a threat to the effective development of ICT in the regions, and stakeholders in regional economic development should see how changes in ICT technologies are offering both opportunities as well as threats to their location's value proposition for hosting high-tech enterprises and attracting high skilled ICT practitioners to 'de-commute'. This is, in fact, already happening in several ways.

6. STRENGTHS AND WEAKNESSES IN THE ROLL-OUT OF THE NEW APPRENTICESHIPS TO DATE

6.1 Strengths or indicators of what has gone well include:

- The strong articulation of the policy commitment by key institutions namely, SOLAS, the HEA, QQI and the Apprenticeship Council and the extent of support for more and better dual-education to be found in our new 'generation' of national policies for enterprise, innovation, the regions, skills, HE and FET;
- The establishment of the Apprenticeship Council;
- The creation of QQI quality and programme validation processes for apprenticeships;

- The high level of response to calls and the formation of consortia targeting a wide range of economic;
- The high level of involvement of HEIs in particular;
- The extent of awareness of the need to include more women in apprenticeships;
- The extent of awareness of the need to make provision of apprenticeship places more feasible and attractive to SMEs;
- Evidence that the career guidance profession, commentators and the media are beginning to become more interested in apprenticeships and other alternatives to immediate entry to university when CAO points are published and being debated

6.2 Weaknesses or what should be going much better include:

- The level of ambition in the targets set, even allowing for the principle that the new arrangements 'should walk before they run', is questionable given the continuing growth of the economy and scale of demand for higher skills at all levels;
- The scale of ETB participation relative to HEIs so far is small and FET Level 6 still appears as 'the forgotten award';
- The pace or speed of the roll out is slow and there is a lack of clarity as to why and of urgency in finding out
  - There is funding confusion and shortfalls. Though we are now in the final quarter of 2018, funding for new FET apprenticeship programmes has still not been finalised or adopted.
  - What is being proposed appears insufficiently tailored to the circumstances of the different consortia.
  - It is difficult to believe that the levels of funding in the current funding template adequately acknowledge the scale of net public savings that will occur when, for example, non-completion within HE is reduced, graduate underemployment after HE is avoided, labour market entry directly after school is circumvented, and people already resident in the country rather than attracted from abroad supply IT skills that are needed.
  - Overall, the lack of adequate funding is impeding the effective roll-out of the new apprenticeship programme as originally envisaged, hampering company participation and candidate access, which if allowed to persist will ultimately erode employer confidence.
- The National Training Fund (NTF) is not being used sufficiently. Indecon has analysed the Fund's income and expenditure over the last seven years and estimates the 2018 outcome is an under-spend of €144 million. It projects a cumulative surplus being carried forward in 2018 of €460m. In this context, there is understandable frustration among consortia.
- The administration process appears to be inefficient. The current process for both Employer Apprenticeship Approval and Apprentice Registration is cumbersome, overly administrative, and appears to be significantly under resourced. This is impeding the timely registration of companies and candidates and, ultimately, the pace of incremental growth in new apprenticeships. In addition, several companies

have expressed concern that the current registration process may be non-compliant with GDPR legislative requirements.

- The promotion and marketing of the new apprenticeships is low key. It is our view that a comprehensive national recruitment campaign directed at candidates, companies and the general public is essential, showcasing the variety of careers and opportunities the new apprenticeships have to offer.

- There has been little advance in understanding how to increase women's participation. While the need to have more women apprentices is widely accepted, insufficient progress is being made as to how to do it and in developing a discourse and messaging about apprenticeships that appeals to women.

- Action on behalf of SMEs has been slow. Awareness of the need that more SMEs should take on apprenticeships has not been matched with greater resources and improved know-how in how to do it.   This is particularly the case where ICT apprenticeships are involved and where SMEs compete directly with leading multi-nationals in the recruitment of human resources to meet their talent and skills needs.

7. RECOMMENDATIONS

FIT presents the following recommendations for consideration by the Committee with the ambition that they contribute to the future development of apprenticeships.

7.1   Carry out a review of existing administration processes for the new apprenticeships to improve their fitness for purpose, efficiency and effectiveness. The processes currently in   use with relation to employer approval and apprentice registration are largely legacy systems developed for traditional apprenticeships and before current requirements such as GDPR came into existence.

7.2   Organise a comprehensive and sustained National New Apprenticeship Recruitment Campaign directed at candidates, companies and the general public, showcasing the variety of careers and opportunities the new apprenticeships have to offer.

7.3   Develop a range of pre-apprenticeship programmes to support wider participation in the ICT apprenticeships and new apprenticeships generally. Vehicles such as Traineeships, VTOS, YouthReach, PLC, Specific Skills Training and other FET programmes could help to support wider participation in new apprenticeships.

7.4   Undertake a high impact school-based awareness campaign to inform parents, career guidance providers, teachers and potential participants that an FET route is a valuable and viable pathway to a career in high skill sectors, including the tech sector.

7.5   Design and resource an SME Apprenticeship Support Scheme to address barriers which may be faced by smaller enterprises in availing of the skills development

opportunity available via the new apprenticeships. Pilot this for ICT Apprenticeships with a view to expanding it across sectors.

7.6   Establish a national Apprenticeship Forum, to capture the learning and experience of consortia, coordinating providers and other key stakeholders, and inform the ongoing development of new apprenticeships.

7.7   Develop and implement a national 'Women in Apprenticeship' campaign, with a vibrant public discourse, to promote apprenticeship as a valued career path for women. Engage a wide range of advocacy groups, employers, thought leaders and influencers to create an enduring impact.

7.8   Set more ambitious targets for the expansion of new apprenticeships to match the strong growth in the economy and the need for additional skills and recruitment streams. We are in danger of aiming low because the adoption of new apprenticeships is a challenging transformation which requires change in mindsets and traditional approaches.

7.9   Develop funding models which more effectively support the early stage development and implementation cycle of new apprenticeships and take account of the diverse needs that pertain across sectors. A 'one size fits all' approach is in danger of slowing or impeding the necessary innovation.

7.10   Some of the NTF's accumulated surplus and a higher proportion of its annual income should be expressly allocated to accelerating the development and implementation of new apprenticeships, recognising the potential of apprenticeship to broaden talent acquisition and thereby further Ireland's future growth and prosperity.
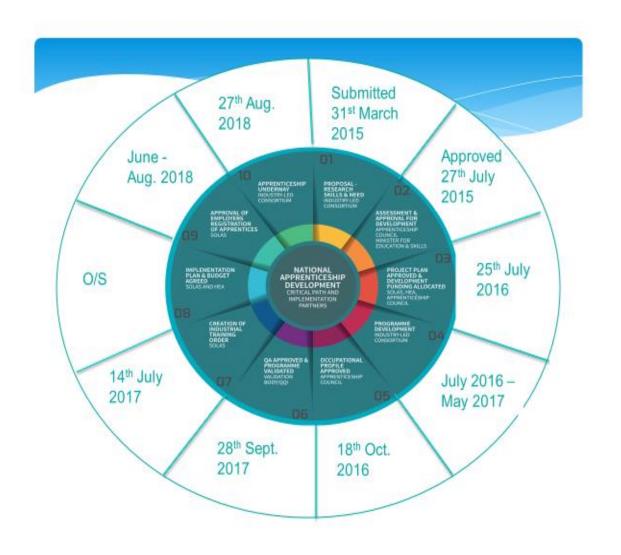
End/

FIT Board of Directors:

1. Liam Ryan	SAP, Chairperson FIT
2. Hilary O'Meara	Accenture
3. Gary O'Callaghan	Siemens
4. Geraldine Gibson	AQMetrics
5. Eimear Gunn	IBM Ireland
6. Joanne Morrissey	Microsoft
7. Aengus McClean	Oath:
8. Ed Taylor	Ebay
9. Adam Grennan	CISCO
10. Daragh Mac Aoghain	PayPal
11. Shane Kirwan	Skillsoft
12. Jason Ward	DELLEMC
13. John Walsh	Fujitsu
14. Una Fitzpatrick	Technology Ireland, IBEC
15. Allan Rochford	Eir
16. Simon Murphy	Deloitte
17. Andrew Lennon	Houghton Mifflin Harcourt
18. Richard Hanlon	Vesta
19. Maria Campbell	Sisk Healthcare
20. Joe Hogan	Openet
21. Charlie Fitzgerald	LinkedIn
22. Kieran Sweeney	eDot
23. Annette Soraine	Innovate

APPENDIX 2

NATIONAL APPRENTICESHIP DEVELOPMENT: - FIT's Journey, March 2015 to November 2018.

APPENDIX 3

Text of the Considerations and Recommendations in FIT ICT Skills Audit 2018.

In addition to providing analysis into the skills, knowledge and competencies currently in demand in Ireland's growing tech sector, this ICT skills audit proposes to inform skills policy development, provide substantive information to education providers to assist programme development and to give some insight to educationalists, career guidance professionals and those interested in pursuing a career in the sector. The following considerations and recommendations are presented with these objectives in mind:

1. **The pervasion of technologies across key sectors of the economy requires redefinition of the 'tech talent' pipeline and greater diversity in its composition.**

   An integral part of making the national economy and regional economies amenable to high-tech will be communicating clearly the enormous potential of the new ICT technologies, across all sectors, in achieving outcomes that are not just improving our lives as consumers but our well-being, societal priorities and environmental concerns.

   Accordingly, the requirement for a broader participation of the population in Ireland's ICT success story as increasingly local industries, enterprises and workplaces adopt new and emerging ICT technologies necessitates vigorous engagement of regional employers and other regional economic stakeholders with the continuum of FET and HE provision.

   The Regional Skills Fora on which the ETBs and third level institutions are represented have a major role in articulating the tech skill requirements of employers regionally (and collectively nationally) while facilitating the coordination of delivery of a comprehensive portfolio of tech programmes across the spectrum of tertiary education (FET + HE) through a jointly developed and comprehensive delivery plan.

2. **Successful economies going forward will be characterised by the ability to adapt rapidly to the challenges and opportunities of the "4th Industrial Revolution".**

   The convergence of technologies, such as Artificial Intelligence (AI), robotics, the Internet of Things (IoT), big data, analytics, etc. are radically transforming how work gets done across global value chains, enabling organisations to be more intelligent, more agile, and better able to scale their operations, optimise supply chains and shift to new business models with unprecedented speed.

   Ireland has undergone a remarkable recovery from a deep recession with full employment now within sight. For the economy to remain resilient to unforeseen shocks, and for future employment to be of a high quality and inclusive of the workforce nationally (across the country's nine regions), foreign investment and, especially, indigenous enterprises must embrace new technologies fully to boost productivity, innovate, grow their markets and most importantly remain competitive.

   It is critical that government, the development agencies and the regions provide the right conditions, skills and capabilities that corporate strategies demand and that they are in a position to clearly articulate how an Irish location can be part of a dynamic company's ambitions for growth.

3. **Successfully orchestrating learning ecosystems will be the critical skills policy challenge in an era of unprecedented digital disruption.**

The pace of change and technological evolution makes it in increasingly difficult to categorise the digital careers that are flourishing today with yesterday's labels. Traditional ICT specialisations are now in danger of encouraging an absence of flexibility where the ability to appreciate developments in a range of ICT fields and to work across them are now particularly highly valued. Today's tech employers require a much broader array of tech skills combined with business development, entrepreneurial, creativity and interpersonal skills. The ability to communicate with others and an approachable demeanour now matter more than before for potential candidates seeking to pursue careers in the high-tech space.

As Ireland's economy, at national and regional levels, is increasingly transformed by digital technologies over the coming years, it is crucial that skills provisioning is aligned and effective in enabling job seekers meet the requirements of a rapidly changing labour market. In the light of emerging technologies anticipation is required on how the labour market will change, and the re-skilling and up-skilling programmes need to be prioritised by government. Ensuring that citizens have the skills to benefit from the opportunities offered by new technological developments is integral to ensuring ongoing prosperity as well as social cohesion.

This entails not just more education, but a transformation in the type of skills that are developed and how they are provided. Crucial in terms of the educational system, is not just what is taught but how it is taught and the achievements that are fostered at each level of the system, particularly during the senior cycle of secondary and upwards. This Audit's findings emphasise the importance of fostering cognitive and non-cognitive capabilities that will enable young people and job seekers pursue emerging and yet unforeseen tech impacted careers successfully. In this regard it is important to think not just in terms of formal education and training systems and their institutions, but to embrace the idea of a learning ecosystem that encompasses public, private and non-government actors who collaborate and share information to achieve mutually beneficial outcomes for learners and themselves.

4. **Dual education initiatives such as the new tech apprenticeship merit the stature they are attaining in current policy and practice as key and essential contributors in addressing the strong demand forecast for ICT Skills.**

This requirement for proficiency across a range of technological competencies combined with a good knowledge of how business gets done necessitates effective application through hands-on learning and professional development to bring them to the levels now required in today's tech workplaces. Accordingly, the potential of dual education programmes (apprenticeships and traineeships), whether in FET or HE, that combine off-the-job training with work-based learning to develop and test these skills has become more appreciated, principally by employers and policy makers, and latterly by those seeking careers in tech related sectors.

5. **5. FET deserves appropriate recognition in policy and practice as a key and essential component in addressing the increasing demand forecast for ICT practitioner skills.**

Consistent with the findings in this report, it has been FIT's experience and conviction for some time, that ICT employers are increasingly convinced of the technical competencies and team working skills delivered through appropriately designed NFQ Level 5 and Level 6 programmes. It is no longer assumed that only people with a higher education are eligible to pursue careers in the technology sectors.

The findings of this skills dialogue reinforce the extent of demand in the ICT sector for people across levels of proficiency, indicating significant levels of demand for people at entry and competent as well as for expert levels. This repeated finding through the cycle of FIT ICT Skills Audits serves to correct with authority what FIT sees as a widespread and persistent misconception that the ICT skills gap is exclusively made up of roles at the apex of the skills triangle i.e. at the 'expert' level. Additionally, it has become clear from the Audits that 'the expertise' requirement articulated by tech employers' relates more to the fruit of experience rather than of the level of qualifications.

This reality requires greater resonance on the part of policy-makers particularly in the drafting of policy documents such as the ICT Action Plan. To date these would appear to undervalue the potential contribution of FET skills programmes in enhancing the tech talent pipeline which is so vital to the sustenance and future growth of related sectors within the Irish economy.

To illustrate the potential contribution of FET provision, the new ICT Associate Professional tech apprenticeship, recently approved by the national Apprenticeship Council, has the goal of delivering a minimum of 1,000 apprentices per annum into the tech sector by 2021 across a range of disciplines including Software Development, Network Engineering, Cyber Security, FinTech and Advanced Manufacturing. In this instance employers will sponsor tech apprenticeships on FET Level 6 programmes from day one.

6. **Remedial actions are needed to realise the significant employment opportunities that currently exist within Ireland's tech sector.**

The findings of the 2018 ICT Skills Audit suggest that there are approximately 12,000 ICT practitioner vacancies currently in the tech sector in Ireland, at entry/competent levels (58%) and expert level (42%). The overall picture that emerges, therefore, is of a thriving tech sector requiring large numbers of additional ICT practitioners. This opportunity if not addressed sufficiently may quickly become a challenge to the sectors global competitiveness as issues relating to resourcing and productivity emerge. Accordingly, it is incumbent on the key stakeholders namely government/ policy-makers, tech related industry/sectors, local development agencies and education and training providers to come together and to work cohesively to deliver a coordinated response in a timely manner. Better coordination in the development, range and delivery of relevant tech training programmes across the continuum of FET and HE (both with their substantive budgets) is a critical and urgent component for success. Regional Skills Fora could facilitate the necessary dialogue between the key stakeholders on an ongoing basis with the expected outcomes clearly articulated in
regional training and development plans annually – which could then be collated into national tech skills development programmes to ensure that both regional and national existing and emerging priorities are met.

7. **7. Ensuring labour market inclusiveness in the tech sector is a shared objective.**

There are strong concerns that advanced countries are neglecting the extent to which groups and regions within their societies are being 'left behind' as technology, globalisation and migration reshape their labour markets. Consequently, the OECD is now committing to assess the labour market performance of its member states, on the basis of the quality and inclusiveness of the employment they provide, in addition to correlation in economic performance and employment statics.

The desire is to redress the cumulative evidence emerging that technologies (principally ICT) and globalisation can, combine to cause a polarisation in national labour markets, to the point of fuelling widespread popular and political opposition to further economic internationalisation. The intent is to ensure that access to decent employment by, for example, women, young people without higher education, older workers, people with a disability, and residents of regions distant from major urban centres is prioritised and actioned to ensure satisfactory labour market performance. Ireland should aim to become the exemplar of social and economic cohesion by incorporating these concerns and necessary responses as cornerstones in future skills development policies.

Recent strategies make clear how much of the 'heavy lifting' in bringing people from disadvantaged starting points to access decent employment must be done by the ETBs, and the Regional Skills Fora, in turn, must play a key role in helping them to do so.

8. **The reach and economic impact of the tech sector is significant and increasing beyond the pale.**

The types of employment of most relevance to this report are those that specifically require ICT skills and a demonstrated competence in using them. The spatial distribution of economic activity and employment in Ireland is one of the most concentrated in the EU/OECD due to the dominance of the Dublin City Region. However, the degree of concentration of ICT practitioners and growth in their numbers observed in large city regions should not be used as templates or benchmarks for assessing the performance across the regions.

The significant growth rates in the numbers of ICT practitioners observed in the smaller regions should be built upon. The evidence suggest that the tech sector already has a degree of regional spread, and what are small numbers in comparison with large concentrated regions are not immaterial within less populated regions and are most likely of greater significance. It follows that what each regional skills forum can ambition, the measures needed to achieve its regional economy's potential and the effectiveness of each forum's performance has to be hugely contextual.

The current imbalance between Dublin and the other regions has to be seen as an opportunity rather than a threat to the effective development of ICT in the other regions. The evidence that a number of the other regions have a substantive and burgeoning ICT practitioner base should be a significant determinant in adopting appropriate policies to build on these firm foundations, providing alternatives locations for those tech sector companies coping with the costs and constraints of urban congestion as depicted in the capital. The regional growth in tech skills as recorded over the inter-census is the more significant metric in determining regional policy development. Attracting large ICT operations to small regions is possible and there are successful examples.

9. **The level of tech employment provided by indigenous companies across key sectors of the economy needs to grow faster.**

It is important to appreciate both nationally and regionally that the full capacities of emerging technologies should be applied to improving the performance and prospects of existing industries and services. This will ensure that important industries and sectors of the economy (farming, wholesale and retail activities, accommodation and food, health services and education, etc.) are enabled and equipped to improve their quality, productivity and efficiency as key pillars of the Irish economy. Some of these companies and sectors play particularly

important roles in the regions, and are most vulnerable if they do not utilise ICTs to innovate, boost their productivity, and develop
new market channels.

In pursuit of the key objectives of maintaining and growing inward investment while fostering faster indigenous growth, it is crucial that, at national and regional levels, enterprises have access to workers with the skills, knowledge and competencies that enable them to exploit the newest ICT technologies.

10. **Informing career choices in a sector where change is a constant requires a continuous dialogue amongst stakeholders.**

The ICT sector in Ireland already has some of the elements of a multifaceted skills ecosystem in place. Yet its representative bodies need to be more proactive in supporting education and training institutions in attaining a full appreciation of the tech ecosystem and the jobs within. This should facilitate a forward-looking perspective on emerging techniques and resulting state-of-the-art technologies that will inform future roles and professions yet to be defined.

Similarly, students/job seekers must be assisted to understand the implications and career prospects emanating from new technologies and their application in an everchanging and dynamic workplace. The impact of digitisation is growing exponentially and employment in IT-related careers is projected to increase at a rate that outpaces most other professions.

While the lack of qualified talent can alter the expansion plans and locational choices of organisations with positions to fill, it simultaneously provides unprecedented career opportunities and prospects for indigenous job seekers willing to develop in-demand tech skills.