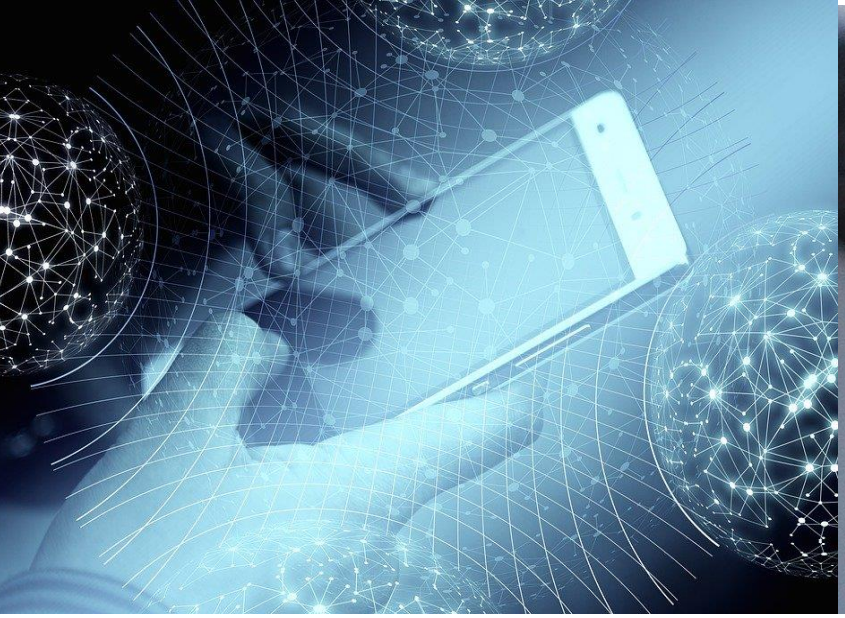


The Marches Sector Skills Deep Dive –

Cyber Security and Resilience

Final Report July 2020

The Marches Local Enterprise Partnership
Herefordshire - Shropshire - Telford & Wrekin

Black Country Consortium
Economic Intelligence Unit

Contents

1. Sector Context

The cyber security and resilience sector accounts for 4.4% of the total GVA which equates to a value of £667m in the Marches. With 4.1% of total jobs arising from the cyber security and resilience sector, this equates to 11,800 jobs. While 1.5% of all establishments in the Marches are in the cyber security and resilience sector which is a total of 535 establishments. The proportion of establishments for the Marches is higher than the UK base.

The key to industrial success in the future is not just establishing cyber businesses. It is also about embedding cyber skills and principles of 'secure by design' into the existing industrial infrastructure. This will provide competitive advantage and increase opportunities for employees to develop skills that make them and their business more attractive on a global market. We also recognise that skills being currently developed could be vulnerable to future automation with a need to ensure there is a route to maximise high value skills and increase resilience moving forward.

The enterprise zone at Skylon Park is the only enterprise zone in the UK with a specialism in defence and security. This enables the Marches to lead the way on cyber security and intelligence in the UK.

The following table displays the GVA, jobs and establishments by the 12 sectors in the Marches.

	GVA (£m)			Jobs			Establishments (Snapshot)		
	2018	**%**	**UK %**	**2018**	**%**	**Eng. %**	**2019**	**%**	**UK %**
Advanced Manufacturing	£2,416m	16.1%	9.7%	32,945	11.4%	8.5%	2,715	7.6%	7.5%
Agri-Tech	£694m	4.6%	1.6%	10,730	3.7%	0.7%	6,270	17.5%	4.9%
Business and Professional Services	£4,367m	29.1%	40.0%	54,320	18.8%	24.7%	9,080	25.4%	35.2%
Construction	£887m	5.9%	6.1%	15,000	5.2%	4.6%	3,595	10.0%	11.1%
Cyber Security and Resilience	**£667m**	**4.4%**	**5.0%**	**11,800**	**4.1%**	**4.7%**	**535**	**1.5%**	**1.1%**
Environmental Technologies	£295m	2.0%	2.7%	3,215	1.1%	1.1%	215	0.6%	0.6%
Food & Drink	£576m	3.8%	1.6%	9,250	3.2%	1.3%	205	0.6%	0.4%
Health and Social Care	£1,241m	8.3%	7.8%	40,900	14.1%	12.9%	1,725	4.8%	5.3%
Public Sector Inc. Education	£1,044m	7.0%	6.3%	30,000	10.4%	11.3%	1,670	4.7%	4.4%
Retail	£1,860m	12.4%	10.6%	49,000	16.9%	15.3%	5,705	15.9%	16.3%
Transport and Logistics	£411m	2.7%	4.1%	9,370	3.2%	4.9%	1,100	3.1%	4.0%
Visitor Economy	£553m	3.7%	4.4%	23,100	8.0%	9.9%	2,980	8.3%	9.2%
Total	**£15bn**			**289,630**			**35,795**		

Source: ONS: Regional gross value added, Business Register Employment Survey and UK Business counts, 2019

The latest data for total GVA in the cyber security and resilience sector was £667m in 2018. This sector accounts for 4.4% of the total GVA for the Marches which is slightly below the UK average of 5.0% of the total[1].

[1] ONS, Regional gross value added (balanced) by industry, 2019

The following table displays the total value of GVA in the Marches.

	The Marches 2017	The Marches 2018	The Marches Change (2017-2018)	The Marches 2018 % of Total	UK 2018 % of Total
Advanced Manufacturing	£2,478m	£2,416m	-£62m	16.1%	9.7%
Agri-Tech	£706m	£694m	-£12m	4.6%	1.6%
Business and Professional Services	£4,169m	£4,367m	£198m	29.1%	40.0%
Construction	£838m	£887m	£49m	5.9%	6.1%
Cyber Security and Resilience	**£686m**	**£667m**	**-£19m**	**4.4%**	**5.0%**
Environmental Technologies	£250m	£295m	£45m	2.0%	2.7%
Food & Drink	£573m	£576m	£3m	3.8%	1.6%
Health and Social Care	£1,118m	£1,241m	£123m	8.3%	7.8%
Public Sector Inc. Education	£1,037m	£1,044m	£7m	7.0%	6.3%
Retail	£1,804m	£1,860m	£56m	12.4%	10.6%
Transport and Logistics	£402m	£411m	£9m	2.7%	4.1%
Visitor Economy	£526m	£553m	£27m	3.7%	4.4%
Total	**£14.6bn**	**£15bn**	**£424m**		

Source: ONS: Regional gross value added, 2019

Based on 2015 EMSI GVA modelled data which allows for greater sectoral breakdown the sector contributed and estimated £459m in total to the UK economy in 2015[2].

The general public administration activities industry accounts for nearly 50% of the cyber security and resilience sector GVA which equates to nearly £229m.

Source: EMSI Analytics Tool, 2020

[2] Please note, due to insufficient data for 2 industries, analysis is based on 10 industries within the cyber security and resilience sector

In 2019, there were 535 establishments in the cyber security and resilience sector[3], this accounts for 1.5% of the total establishments in the Marches which is slightly above the UK average of 1.1%.

The following table displays the number of establishments in the Marches.

	The Marches 2019	The Marches 2019 % of Total	UK 2019 % of Total
Advanced Manufacturing	2,715	7.6%	7.5%
Agri-Tech	6,270	17.5%	4.9%
Business and Professional Services	9,080	25.4%	35.2%
Construction	3,595	10.0%	11.1%
Cyber Security and Resilience	**535**	**1.5%**	**1.1%**
Environmental Technologies	215	0.6%	0.6%
Food & Drink	205	0.6%	0.4%
Health and Social Care	1,725	4.8%	5.3%
Public Sector Inc. Education	1,670	4.7%	4.4%
Retail	5,705	15.9%	16.3%
Transport and Logistics	1,100	3.1%	4.0%
Visitor Economy	2,980	8.3%	9.2%
Total	**35,795**		

Source: ONS: UK Business Counts, 2019

[3] ONS: UK Business Counts 2019. Please note, currently the ONS Business Demography dataset does not provide a breakdown by industry for all registered establishments, the breakdown can be obtained from the ONS UK Business Counts which is a snapshot (March 2019) of the Business Demography dataset.

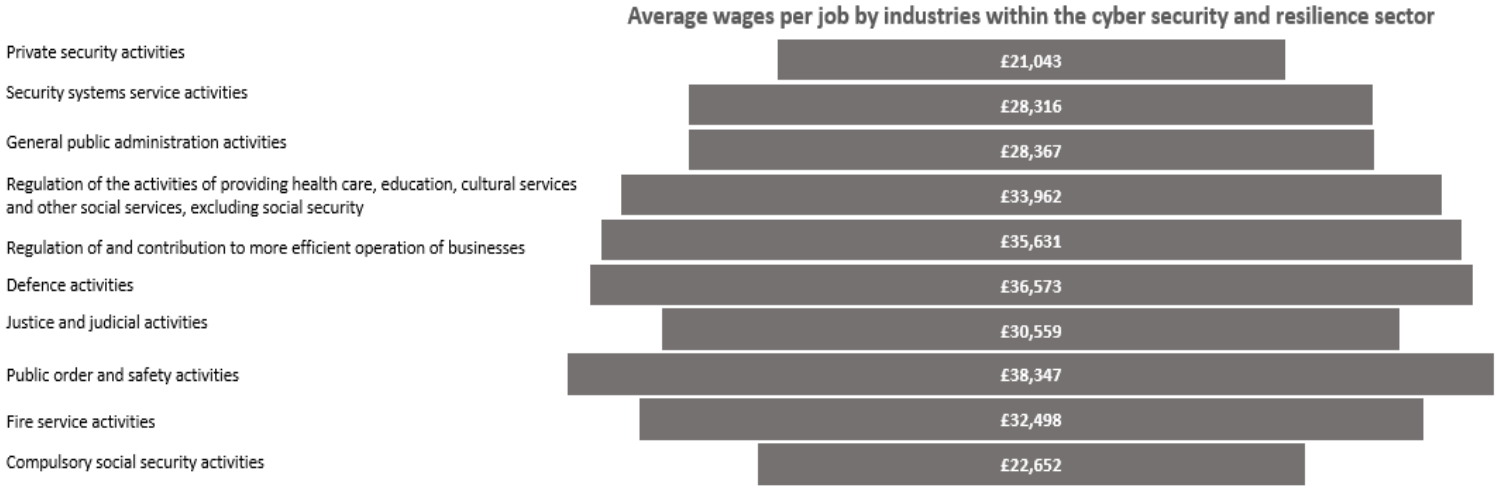
In 2019, general public administration activities and private security activities accounted for nearly 76% (totalling 405 establishments) of the total cyber security and resilience establishments within the Marches[4]. **The following figure shows the breakdown by the number of establishments by industry within the cyber security and resilience sector.**

Source: ONS: UK Business Counts, 2019

[4] EMSI Analytics tool, 2020

The overall average wages for the cyber security and resilience sector in the Marches is £30,679, with 5 industries above the average.

The following figure shows the average wages per job across the cyber security and resilience by industry.



Source: EMSI Analytics Tool, 2020

Location Quotients (LQs) are a way of quantifying how concentrated a particular industry, cluster, occupation, or demographic group is in a region as compared to the nation. It can reveal what makes a particular region "unique" in comparison to the national average. Higher LQs correspond to higher levels of specialisation, with an LQ above 1 indicating that the area is more specialised in that sector than Great Britain as a whole. In 2018, out of the 10 industries, 2 are above 1[5].

The following table displays LQs for the cyber security and resilience sector in the Marches.

Industry	2018 Location Quotient
Defence activities	2.53
Fire service activities	1.15
Compulsory social security activities	0.93
General public administration activities	0.92
Public order and safety activities	0.74
Security systems service activities	0.50
Regulation of the activities of providing health care, education, cultural services and other social services, excluding social security	0.46
Justice and judicial activities	0.40
Private security activities	0.31
Regulation of and contribution to more efficient operation of businesses	0.11

Source: EMSI Analytics Tool, 2020

[5] EMSI Analytics tool, 2020

2. Supply Side Analysis

2.1. Current Workforce Size[6]

There were an estimated 11,800 jobs in the cyber security and resilience sector in 2018. This accounts for 4.1% of the total jobs, below the England average of 4.6%[7].

	The Marches 2018	The Marches 2018 % of Total	England 2018 % of Total
Advanced Manufacturing	32,945	11.4%	8.5%
Agri-Tech	10,730	3.7%	0.7%
Business and Professional Services	54,320	18.8%	24.7%
Construction	15,000	5.2%	4.6%
Cyber Security and Resilience	**11,800**	**4.1%**	**4.7%**
Environmental Technologies	3,215	1.1%	1.1%
Food & Drink	9,250	3.2%	1.3%
Health and Social Care	40,900	14.1%	12.9%
Public Sector Inc. Education	30,000	10.4%	11.3%
Retail	49,000	16.9%	15.3%
Transport and Logistics	9,370	3.2%	4.9%
Visitor Economy	23,100	8.0%	9.9%
Total	**289,630**		

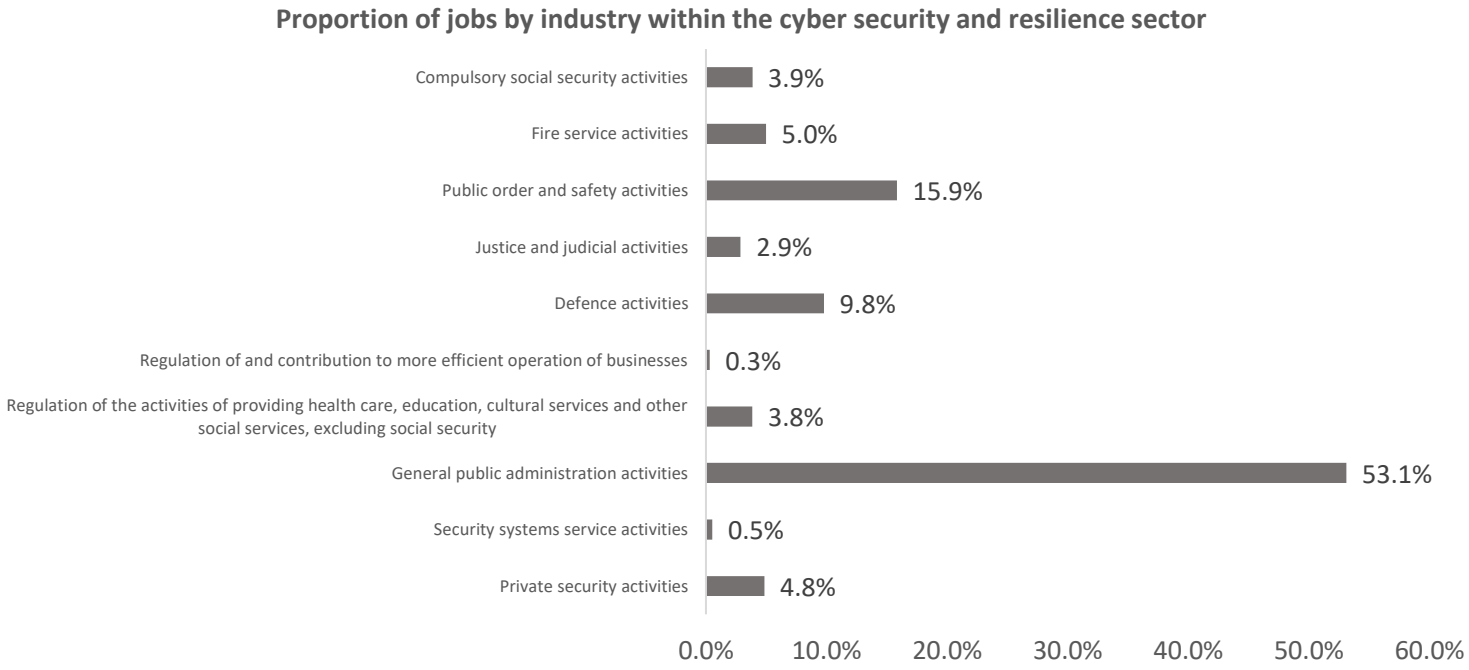
Source: ONS: Business Register and Employment Survey, 2019

Sector Analysis

EMSI provide a more detailed breakdown of jobs by industry and based on their total of 11,295 jobs in 2018- within the cyber security and resilience sector, general public administration activities, public order and safety activities and defence activities accounts for nearly 79% of total sector jobs, this equates to approximately 8,898 jobs in 2018[8].

[6] Please note depending on the source – BRES, EMSI – SIC or SOC codes there is some variation in the total jobs figures.
[7] ONS, Business Register and Employment Survey, 2019
[8] Please note, figures will vary as EMSI Analytics tool, 2020 has been used for further analysis.

The following graph shows the proportion each industry accounts for of the total jobs within the cyber security and resilience sector.



Source: EMSI Analytics Tool, 2020

Occupation Analysis[9]

Cyber security is a broad and varied discipline that has grown rapidly and organically in recent years. This rapid development has led to a fragmented narrative around cyber security skills and a lack of coherence between the different specialisms compounded by the absence of an agreed definition.

Cyber security and resilience skills are demanded by employers in all sectors. The National Cyber Security Strategy (NCSS) seeks to tackle these barriers by formulating a definition of what constitutes cyber security skills. The NCSS suggests that the skills all organisations need are a combination of essential and advanced technical expertise, strategic management skills, planning and organisation skills.

Using this broad sector definition, we have identified 17 occupations associated with cyber and security and resilience sector. The most prevalent role in the Marches is 'IT specialist managers' which account for 15% of jobs in the sector.

[9] Occupation and industry classifications categorise occupations and industries into clearly defined groups. As such they provide a common basis for collecting, presenting, and comparing of labour statistics. **Occupational** classifications (SOC) group people based on job and tasks performed whereas **Industry** (SIC) classifications group people based on the sector of economic activity in which they are employed. For the purpose of this work we have attributed occupations to their most natural industrial sector, so for example a 'Financial Accounts Managers' whose skills are transferrable across all sectors will be contained solely within Business and Professional Services**.** Any identified skills gap for this occupation would apply to all sectors**.**

The table below identifies the 17 occupations associated with the cyber security and resilience sector:

Description	2018 Jobs
IT specialist managers	1,621
Programmers and software development professionals	1,532
Information technology and telecommunications professionals n.e.c.	1,222
IT operations technicians	975
Electrical and electronic trades n.e.c.	820
IT user support technicians	769
IT business analysts, architects and systems designers	650
Skilled metal, electrical and electronic trades supervisors	493
IT project and programme managers	472
Information technology and telecommunications directors	443
IT engineers	354
Telecommunications engineers	334
Assemblers (electrical and electronic products)	327
Web design and development professionals	286
Communication operators	245
Electronics engineers	194
Electrical and electronics technicians	127
	10,864

Source: EMSI Analytics Tool, 2020

2.2. Existing Training Provision

2.2.1. Apprenticeship Provision

Apprenticeships Starts

Apprenticeships are a key part of improving skills and providing training opportunities, whether this is training new recruits, upskilling existing staff in their current role, or re-training existing staff for a new role.

The total number of apprenticeships in the Marches (across all sectors) increased to 6,360 from 6,020 in 2018/19 - up 5.5% compared to 4.7% nationally.

The table below identifies the unique apprenticeship starts by area across the Marches LEP for all cyber security and resilience related subjects.

Local Authority	2016/17	2017/18	2018/19	Change 17/18 - 18/19	% Change 17/18 - 18/19
Herefordshire, County of	40	40	60	20	50.0%
Shropshire	260	290	320	30	10.3%
Telford and Wrekin	70	60	90	30	50.0%
Marches LEP	**370**	**390**	**470**	**80**	**20.5%**

Source: ESFA Datacube, 2018/19

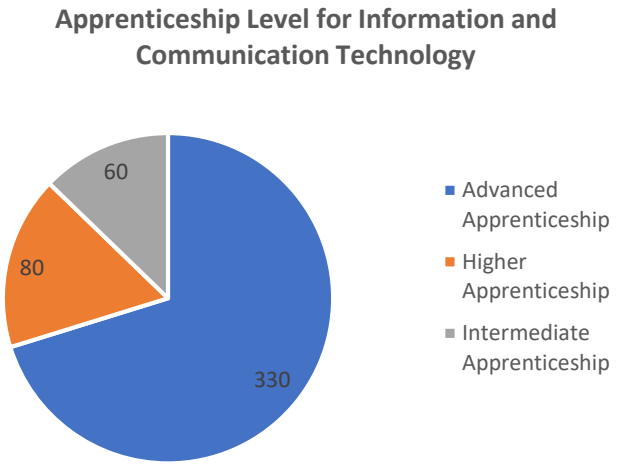
The number of cyber security and resilience related apprenticeships increased by 20.5% across the Marches in 2018/19 to 470. All three local authority areas reported increases in the number of apprenticeships. In Telford and Wrekin and Herefordshire the number of starts increased by 50%. The most apprenticeships remained in Shropshire which increased by 10.3% to 320.

The table below identifies the number of starts by Tier 2 sector subject areas that contain apprenticeships relating to the 'cyber security and resilience' sector.

Sector Subject Area	2016/17	2017/18	2018/19	Change 17/18 - 18/19	% Change 17/18 - 18/19
Information and Communication Technology					
ICT for Users	30	20	30	10	50.0%
ICT Practitioners	340	370	440	70	18.9%
Marches LEP	**370**	**390**	**470**	80	20.5%

Source: ESFA Datacube, 2018/19

Apprenticeships starts for 'Information and Communication Technology' increased by 20.5% or 80 in absolute numbers in 2018/19. The largest increase in starts were contained within 'ICT Practitioners' which increased by 70 or 18.9%.



Source: ESFA Datacube, 2018/19

Following national trends, apprenticeships starts in Information and Communication Technology were more likely to be at either advanced or higher level in 2018/19 than in 2017/18. Advanced apprenticeships increased by 6.1% to 330 whilst Higher apprenticeships increased by 6.5% to 80. As an overall proportion, Intermediate apprenticeships fell by -0.4% but increased by 10 in absolute terms.

In total, 45 organisations delivered apprenticeships in Information and Communication Technology in 2018/19. The majority of training was provided by the 10 providers listed below, which accounted for 85%.

Provider	2016/17	2017/18	2018/19
ROYAL AIR FORCE	200	210	240
BRITISH TELECOMMUNICATIONS PUBLIC LIMITED COMPANY	20	30	40
QA LIMITED	20	10	30
TELFORD COLLEGE	20	20	20
HEREFORDSHIRE, LUDLOW, AND NORTH SHROPSHIRE COLLEGE	30	20	20
SBC TRAINING LIMITED	3	10	10
THE DEVELOPMENT MANAGER LTD	3	10	10
BABINGTON BUSINESS COLLEGE LIMITED	<10	10	10
ASTON UNIVERSITY	10	10	10
REMIT GROUP LIMITED	<10	<10	10

Source: ESFA Datacube, 2018/19

The Royal Air Force remains by far the biggest provider in the Marches followed by British Telecommunications PLC.

Apprenticeship Provision

A mapping and gapping exercise of all apprenticeship provision in the Marches has highlighted that there are 56 apprenticeship providers offering apprenticeships in the cyber security and resilience sector within 55 miles of the Marches. This was calculated by using the most central postcode SY8 2AF.

The table in the supporting appendix shows the current apprenticeship training provision for each of the standards associated with the cyber security and resilience sector across the West Midlands: 22 out of the 35 apprenticeship standards associated with the sector are being offered within 55 miles of the Marches. Most provision is held at the training provider, with some courses offering training at the employer. A colour coding system was used to map and gap the provision, with a preference for learning at providers taking priority in the colour coding, as some providers offer both onsite and offsite learning, which would be coloured green in the matrix.

10 courses were not being catered for anywhere across England at the time of analysis, including Creative digital design professional, Digital community manager, Digital user experience (UX) professional (integrated degree), Network cable installer, and in 2 extra cases no provision was available in the West Midlands (Intelligence Analyst & Wireless Communications Rigger).

2.2.2. Further and Higher Education Provision

Further and Higher Education providers are significant players in the vocational training marketplace. Their role alongside private training providers is to offer opportunities for both the future and existing workforce to access relevant training in the cyber security and resilience sector.

Specifically, there are the following major further and higher education establishments within the area:

- Herefordshire, Ludlow and North Shropshire College

- Telford College
- Shrewsbury Colleges Group
- Harper Adams University
- University Centre Shrewsbury (University of Chester)
- University of Wolverhampton
- NMITE

Higher Education (HESA)

Harper Adams University specialises in the agricultural and rural sector and has significant research experience in automation which requires the highest standards of cyber security. The University of Chester has a centre in Shrewsbury specialising in subjects aligned to medicine and healthcare, business, and education. The University of Wolverhampton has a well- established campus in the Marches, located at Priorslee in Telford, which currently specialises in engineering and University Centre Telford in Southwater which delivers education, marketing and business management.

NMITE is a new higher education institution in Hereford which will focus on technology and engineering subjects and will add capacity to the development and delivery of cyber related subjects.

Cyber Quarter – the Midlands Centre for Cyber Security is a major investment by the University of Wolverhampton and Herefordshire Council, with funding from ERDF and Marches LEP Local Growth Fund, which will increase capacity for skills development, research and innovation for the cyber security and resilience sector.

The table below sets out the number of students studying in these institutions in the academic year 2018/19. The data relates to all campuses not just those based across the Marches.

Sector	Harper Adams	University of Chester	University of Wolverhampton
Advanced Manufacturing	275	345	1,445
Agri-Tech	4,755	1,020	2,300
Business and Professional Services	135	3,020	4,060
Environmental Technologies	20	370	0
Food and Drink	160	0	0
Health and Social Care	25	4,645	4,300
Public Sector inc. Education	5	2,925	4,655
Construction	0	0	0
Cyber security and resilience	**0**	**200**	**0**
Transport and Logistics	0	10	0
Visitor Economy	0	1,785	2,295
Retail	0	245	0
Total	**5,375**	**14,565**	**19,045**

Source: HE student enrolments by HE provider and subject of study 2018/19

In 2018/19 there were no students on courses aligned to cyber security and resilience at Harper Adams, and due to the availability of data at a low level we were unable to determine those who were cyber security and resilience related courses at the University of Wolverhampton.

At the University of Chester there were 200 students studying courses in the cyber security and resilience sector, this is down by 110 (-35.5%) since the previous year. These students made up 1.4% of the student body.

Qualifications and skills are on a spectrum, with many academic qualifications now having considerable employer input, and many vocational and professional qualifications being delivered by universities. There is an identified need for both detailed subject knowledge and transferable skills to be part of vocational qualifications: 'many formerly purely technical occupations are expected to show a new demand for creative and interpersonal skills' (World Economic Forum, 2016). Health and engineering are examples where such a binary divide becomes unhelpful. Employers will need all of the skills and qualifications along this spectrum, at different times and in different combinations, and learners and employees will need to be able to move along this spectrum and should be supported in doing so.

3. Demand Side Analysis

Cyber security and resilience related skills are becoming more important with the digitalisation of the world and advancement of technology. However, a study from digital resilience experts RedSeal, identifies major concerns about business' ability to develop, attract and retain new talent with the right skillset to stand up against an ever growing threat landscape. Their research found that 87% of businesses reported that they were struggling to find cybersecurity professionals with the expertise needed to combat serious and organised online crime.

Within the Marches, analysis of cyber security and resilience job vacancies in the last year (January 2019 to January 2020) reveal 31,178 total job adverts, of which 5,960 were unique vacancies.

The highest demand was in Telford and Wrekin, which accounted for 39.4% of all unique vacancies, followed by Herefordshire (31.4%) and Shropshire (29.1%).

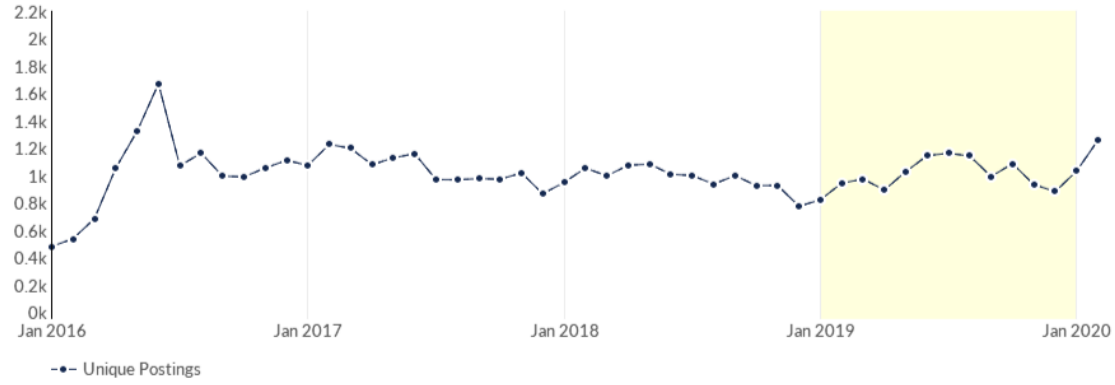
Job Postings Regional Breakdown

Local Authority	Unique Postings (Jan 2019 - Jan 2020)
Telford and Wrekin	2,346
Herefordshire, County of	1,877
Shropshire	1,737

Source: EMSI Analytics Tool, 2020

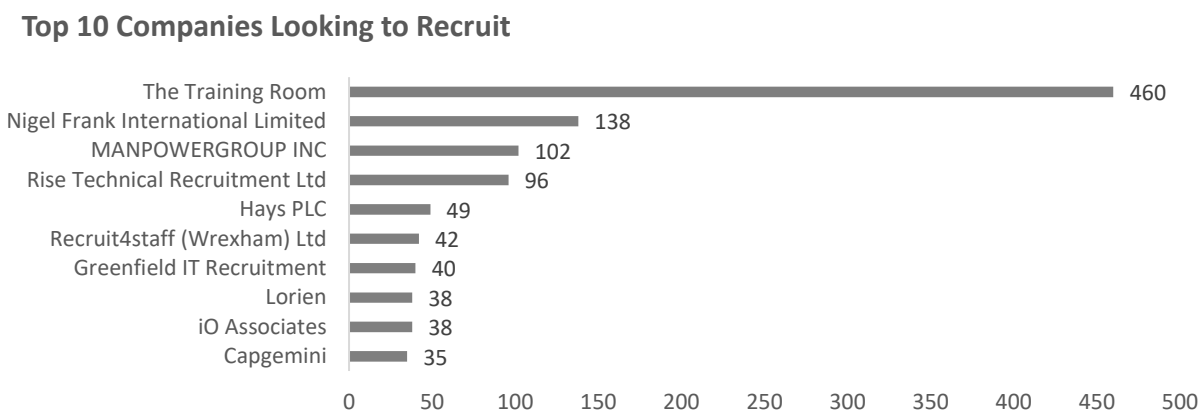
The graph below shows the long-term monthly trend for total job adverts for openings in the cyber security and resilience sector. The number of adverts increased from 480 in January 2016 to 1,256 in January 2020. This is an increase of 161.7%.

Monthly Unique Postings



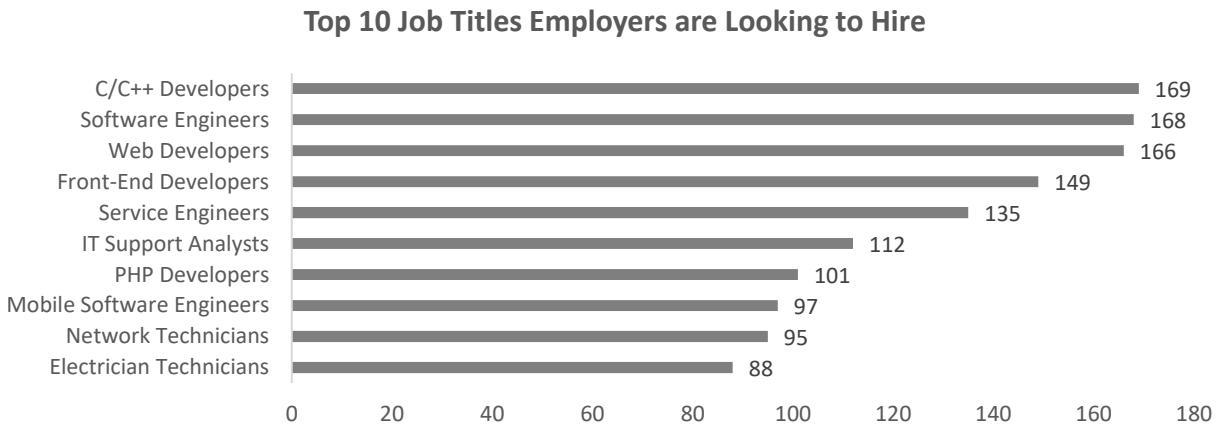
Source: EMSI Analytics Tool, 2020

The top 10 companies looking to recruit to the cyber security and resilience sector accounts for 17.4% of all unique vacancies posted in the Marches area.



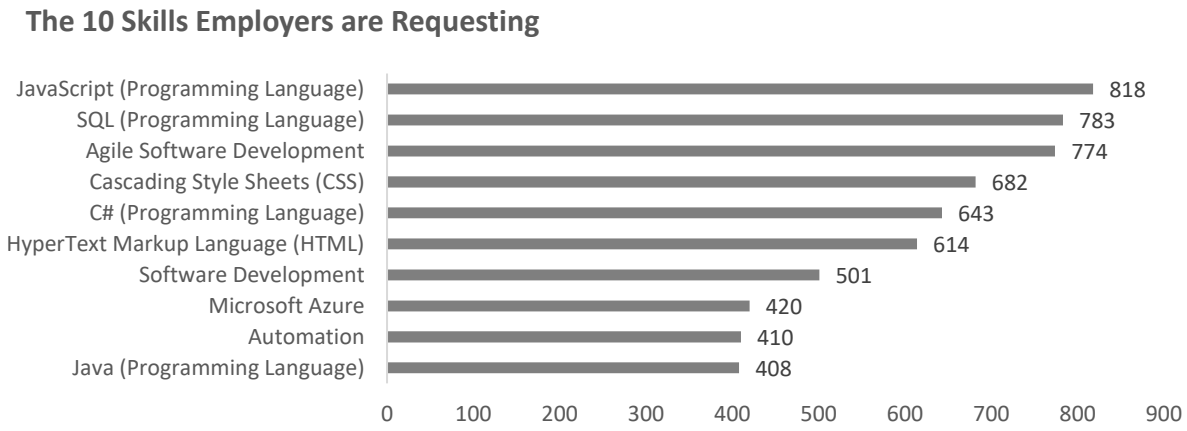
Source: EMSI Analytics Tool, 2020

Three of the top 10 job titles were engineers, and these accounted for 6.7% of the total unique postings. Overall, the top 10 job titles that employers were looking to hire accounted for 21.5% of all unique job postings.



Source: EMSI Analytics Tool, 2020

The top skill that employers in the cyber security and resilience sector were looking for in candidates was JavaScript (Programming Language). This was required in 818 (13.7%) of unique job postings.



Source: EMSI Analytics Tool, 2020

3.1. Occupational Forecasts

In this section of the report we use UKSOC 4-digit 2010 classifications to understand at a granular level the types of occupations and activities forecast to be required for roles within the cyber security and resilience sector.

Description	2018 Jobs	2022 Jobs	2018 - 2022 % Change	2018 - 2022 Openings	Education Level	Automation Index
IT specialist managers	1,621	1,588	-2%	200	Honours, Bachelor's degree	N/A
Programmers and software development professionals	1,532	1,499	-2%	207	Honours, Bachelor's degree	0.1%
Information technology and telecommunications professionals n.e.c.	1,222	1,175	-4%	161	Honours, Bachelor's degree	1.6%
IT operations technicians	975	955	-2%	122	Level 3 NVQ; A Levels	4.2%
Electrical and electronic trades n.e.c.	820	813	-1%	108	Level 3 NVQ; A Levels	47.4%
IT user support technicians	769	749	-3%	97	Level 3 NVQ; A Levels	2.4%
IT business analysts, architects and systems designers	650	639	-2%	86	Honours, Bachelor's degree	7.2%
Skilled metal, electrical and electronic trades supervisors	493	503	2%	68	Level 3 NVQ; A Levels	3.5%
IT project and programme managers	472	464	-2%	61	Honours, Bachelor's degree	5.1%
Information technology and telecommunications directors	443	434	-2%	77	Honours, Bachelor's degree	N/A
IT engineers	354	327	-8%	41	Honours, Bachelor's degree	1.3%
Telecommunications engineers	334	330	-1%	43	Level 3 NVQ; A Levels	55.8%
Assemblers (electrical and electronic products)	327	326	0%	42	Level 2 NVQ; GCSE at grades A*-C	72.0%
Web design and development professionals	286	286	0%	40	Honours, Bachelor's degree	1.4%
Communication operators	245	245	0%	34	Level 2 NVQ; GCSE at grades A*-C	16.8%
Electronics engineers	194	192	-1%	24	Honours, Bachelor's degree	2.2%

Electrical and electronics technicians	127	125	-2%	16	Level 4 NVQ; Intermediate, DipHE, DipFE	38.6%
Total	**10,864**	**10,651**	**-2%**	**1,428**		

Source: EMSI Analytics Tool, 2020

In total there are 17 occupations associated with the cyber security and resilience sector. Occupations in the sector are dominated by occupations with the IT industry,

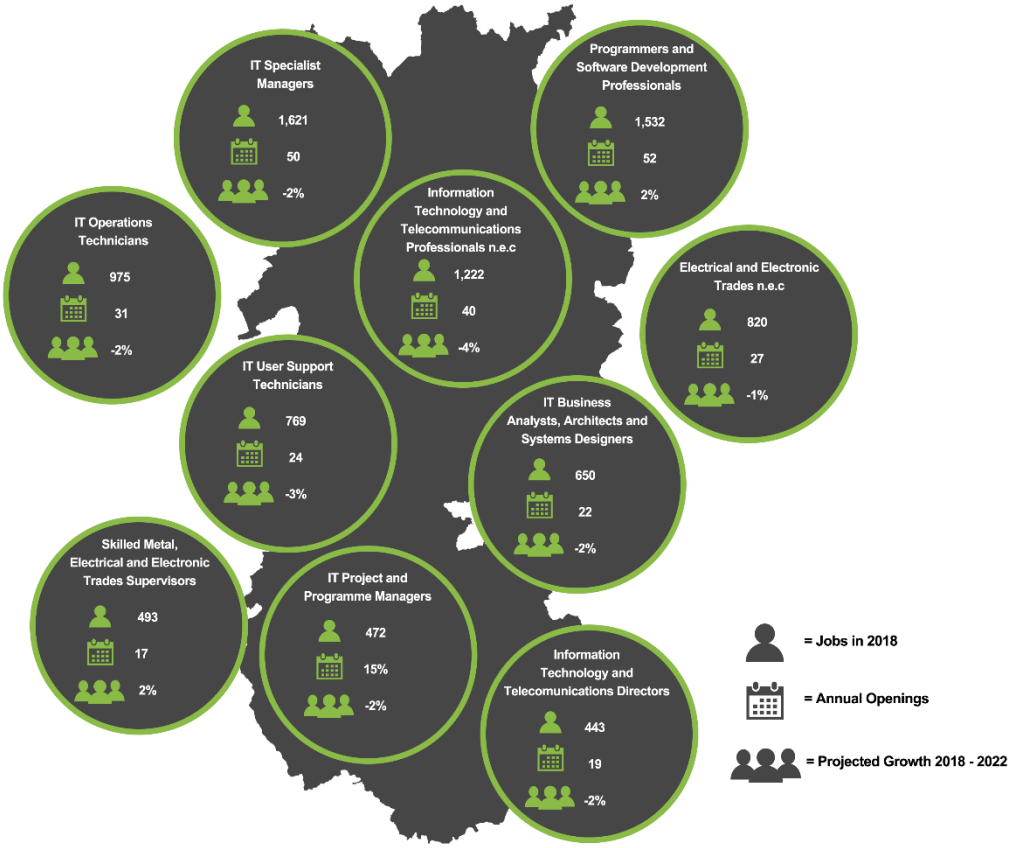
Of the 17 occupations listed above, only one is forecasted to grow 'Skilled metal, electrical and electronic trades supervisors'. Of the rest, three are predicted to undergo nominal change (+/- in absolute numbers) while 13 are forecast to contract. Indeed, the overall number of jobs within the sector are projected to decrease -2% or 213 in absolute numbers.

It is important to note that while occupation forecasts provide estimates of the numbers of people likely to be employed in each occupation, they do not provide an indication of the wider need for employers to recruit in order to replace people lost through migration, retirement or through career changes. It is also particularly relevant for this sector to note that these forecasts are linear projections based on historical trends and do not consider any vision-based scenarios or wider economic trends. The Marches LEP, as part of the Cyber Resilience Alliance/Cyber Valley partnership, has voiced its aspiration to grow the sector and to contribute to the development of the biggest cyber security cluster outside of London.

With this in mind, a useful barometer of demand in the sector is therefore the projected openings, which show an additional 1,428 vacancies over the period analysed. This identifies significant growth for both 'IT specialist managers' and 'Programmers and software development professionals' amongst others which align closely with required roles within cyber security and resilience and the wider economy.

Most occupations in the cyber security and resilience sector score low on the automation index (the automation index captures an occupation's risk of being affected by automation). Indeed, only two occupations are rated above 50%, 'Assemblers (electrical and electronic products)' (72.0%) and 'Telecommunications engineers' (55.8%).

The Marches Top 10 Cyber Security and Resilience Occupations



3.2. Job Forecasts by Industry

The analytical tool below suggests, in contrast to local aspirations, that overall, the cyber security and resilience sector is projected to decrease by approximately 857 jobs by 2022. This is related to the challenge of attributing generic and specialist roles, including IT and digital functions, to this sector.

Within the cyber security and resilience sector, the public order and safety activities industry is projected to increase by approximately 27 by 2022[10].

[10] EMSI Analytics tool, 2020

The following table shows 2018 jobs and the projected change by industry within the sector by 2022.

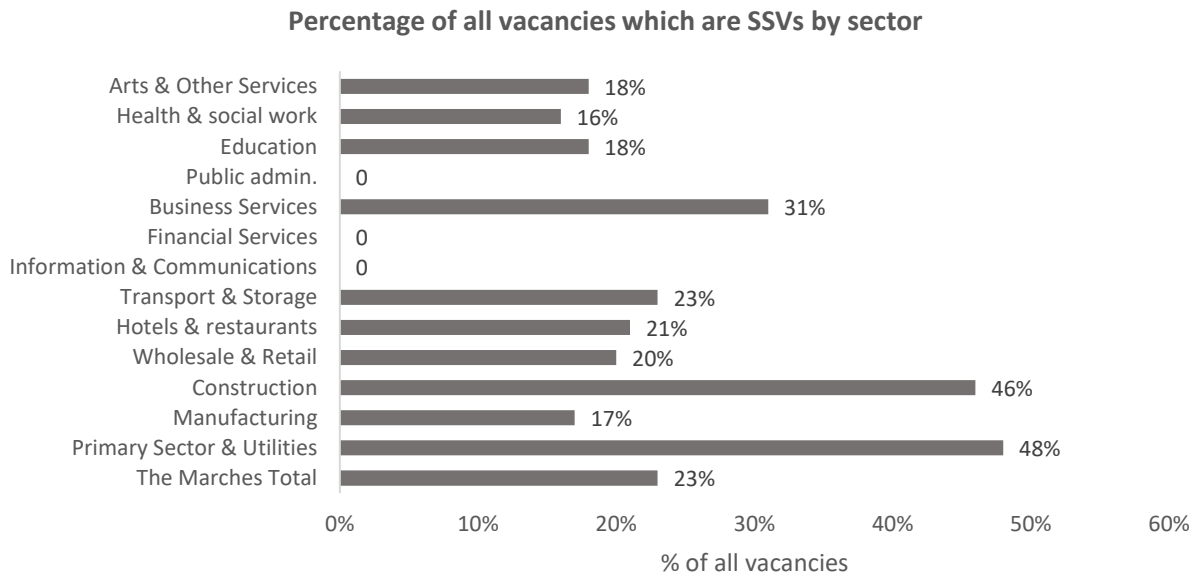
Industry	2018 Jobs	2022 Jobs	2018 – 2022 Change
Public order and safety activities	1,791	1,818	27
General public administration activities	6,001	5,710	-291
Private security activities	547	381	-166
Defence activities	1,107	946	-161
Compulsory social security activities	436	349	-87
Justice and judicial activities	324	251	-73
Fire service activities	564	509	-55
Regulation of the activities of providing health care, education, cultural services and other social services, excluding social security	433	405	-28
Security systems service activities	59	47	-12
Regulation of and contribution to more efficient operation of businesses	34	22	-12
Total	**11,295**	**10,438**	**-857**

Source: EMSI Analytics Tool, 2020

3.3. Sector Skill Shortages

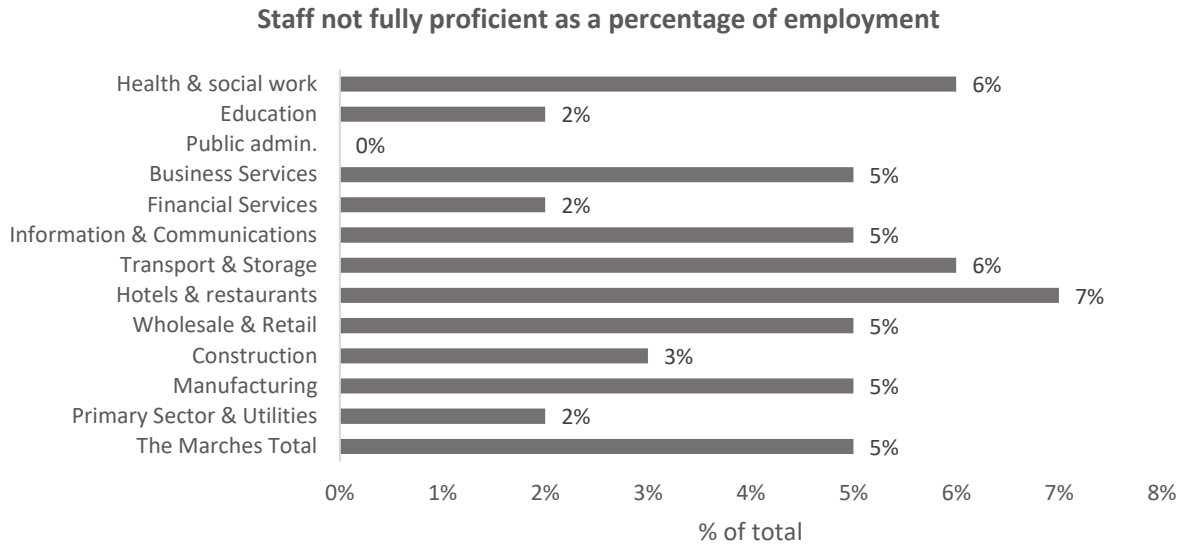
23% of all vacancies are skills shortage vacancies, compared to 22% nationally. The graph above highlights the acute problem of skills shortage vacancies in certain sectors.

Cyber security and resilience, defined in the graph as information and communications, does not report any information regarding skills shortage vacancies in the Marches.



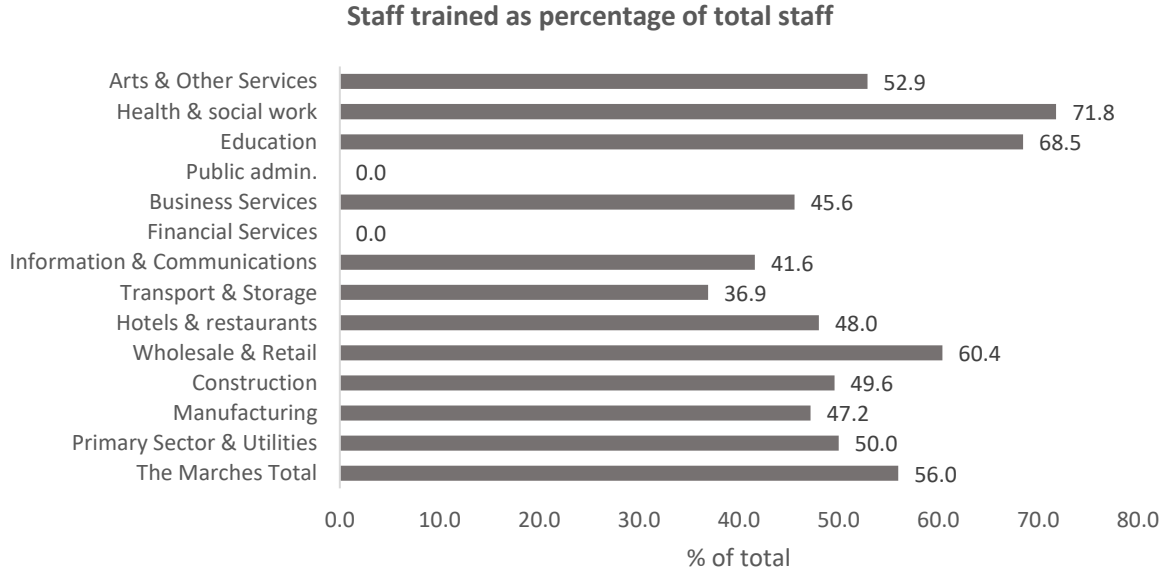
Source: Employer Skills Survey 2017, LEP Summary Tables

5% of staff are not fully proficient in the Marches, compared to 4% nationally. In the cyber security and resilience sector, 5% of staff are not fully proficient. This shows there are some skills lacking within the current workforce.



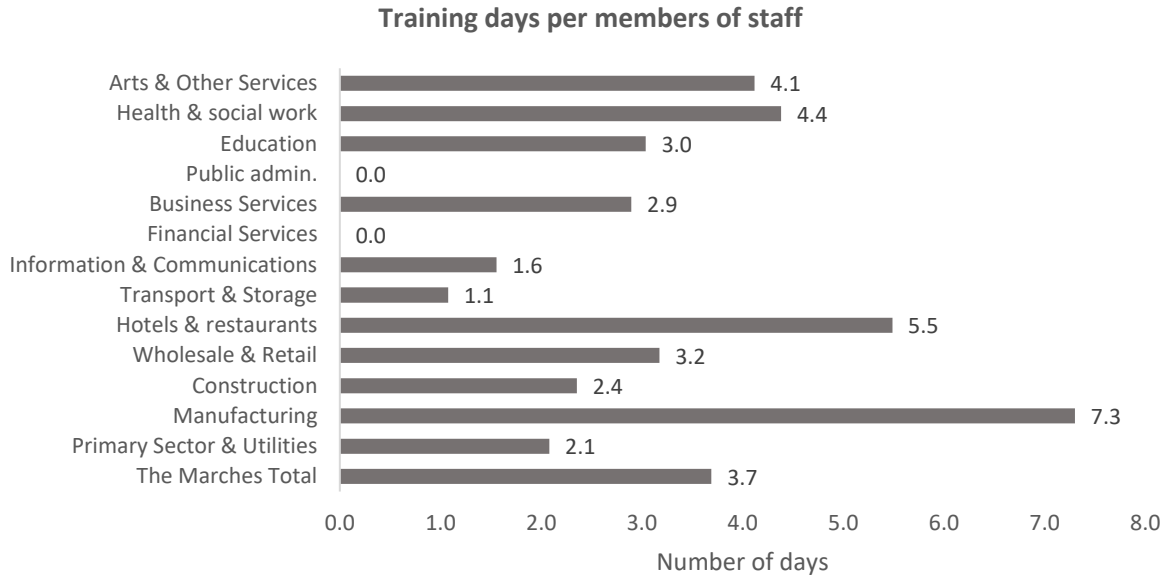
Source: Employer Skills Survey 2017, LEP Summary Tables

In the Marches, 56.0% of staff are trained as a percentage of all staff, compared to 62.2% of staff in England. 41.6% are trained in the cyber security and resilience sector. This sector has a very low training rate compared to other sectors but reports low levels of staff not being fully proficient which suggests that current staff are equipped with the required skills employers want.



Source: Employer Skills Survey 2017, LEP Summary Tables

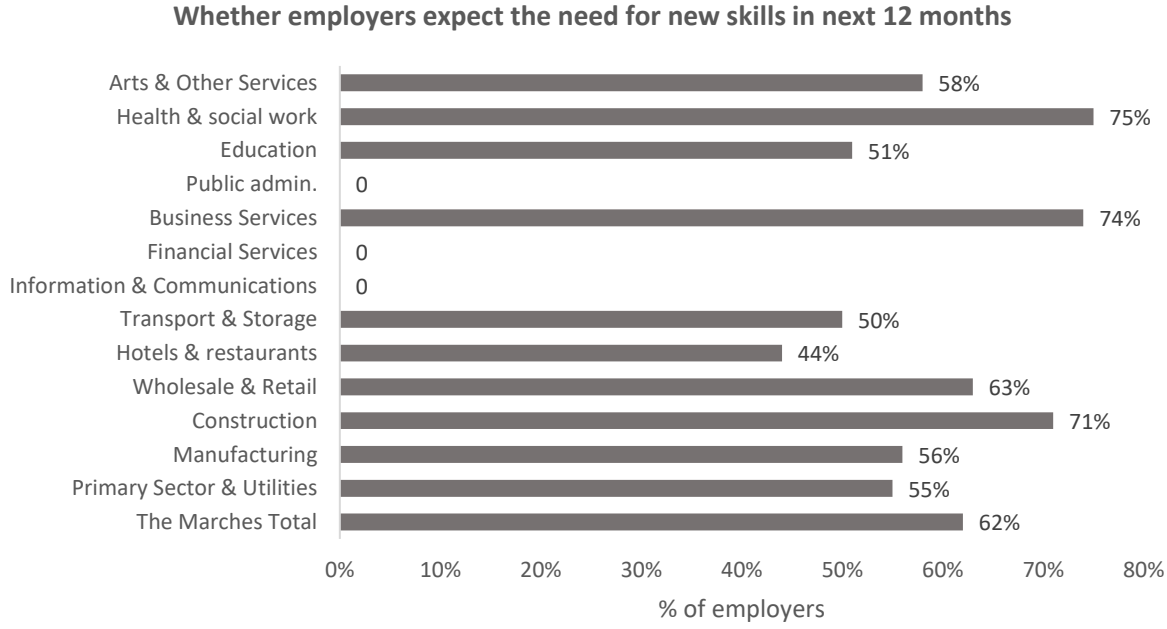
On average, employees in the Marches have 3.7 training days. In the cyber security and resilience sector this is 1.6 days. Low levels of staff training and low levels of skills gaps signifies that employers are addressing skill shortages within the sector due to high proficiency levels of staff.



Source: Employer Skills Survey 2017, LEP Summary Tables

62% of employers in the Marches expect the need for new skills in the next 12 months, this is the same as national levels. In the cyber security and resilience sector, no data is available.

Looking at levels for the Marches average, there may be a significant skills shortage in the future. Upskilling may be the preferred solution to this problem – that is, training current employees with new skills to ensure they can keep up with a changing work environment e.g. enhancements in digital technology. Upskilling gives employers a chance to 'grow their own'. Employers should invest more in training to equip current staff with the skills they are looking for from new recruits to address this skills issue.



Source: Employer Skills Survey 2017, LEP Summary Tables

4. Supply vs Demand

4.1. Provision Review

In this section of 'Supply vs Demand' we will concentrate on the most significant areas of misalignment and gaps across the sector. Identifying which courses are currently over-supplying the labour market, which areas of labour market demand is currently being met and where there might be areas of opportunity for the development of new skill provision.

Discipline	Completers 2019	Annual Openings	Gap Between Demand and Provision	% Jobs Growth (2019-2022)
Security	10	82	72	-2%
Computer Engineering	0	32	32	-3%
Mathematics and Statistics	1,492	16	1,476	4%
IT User Skills	964	55	-909	-2%
ICT Practitioners	1,074	350	-724	-1%
Electrical and Electronic Technology	221	115	-106	0%
Electrical and Electronics Engineering	124	22	-102	1%

Source: EMSI Analytics Tool, 2020

Green: Areas where the provider base already offers courses, but the data indicates that there may be room to grow these to meet employment demand.

Blue: Courses the provider base does not currently offer, indicating that there is potential for creating new courses to meet these skills needs.

Yellow: Areas where the data suggests that the provider base is currently oversupplying the labour market to a significant level.

Skills provision that is aligned to local jobs and industry demand not only helps providers with their Ofsted inspection but also helps to ensure learners are best placed to get employment using the skills they have learned, supply employers with the skills they need and support growth in the local and wider economy.

This provision review identifies areas of misalignment in the Marches for the cyber security and resilience sector:

Strengths (course areas that are well met compared to industry demand)

Course areas which have a gap between supply and demand, where that there is less provision than supply is possibly where there is still potential to increase provision locally. This includes the discipline highlighted green in the table, e.g. security.

Opportunities (course areas that are currently under supplied compared to demand)

Other opportunity areas include those highlighted in blue with a gap between provision and demand, as these are the disciplines which are sought after but have no provision locally. There is room for courses to be developed in these disciplines to meet local employer needs, e.g. computer engineering.

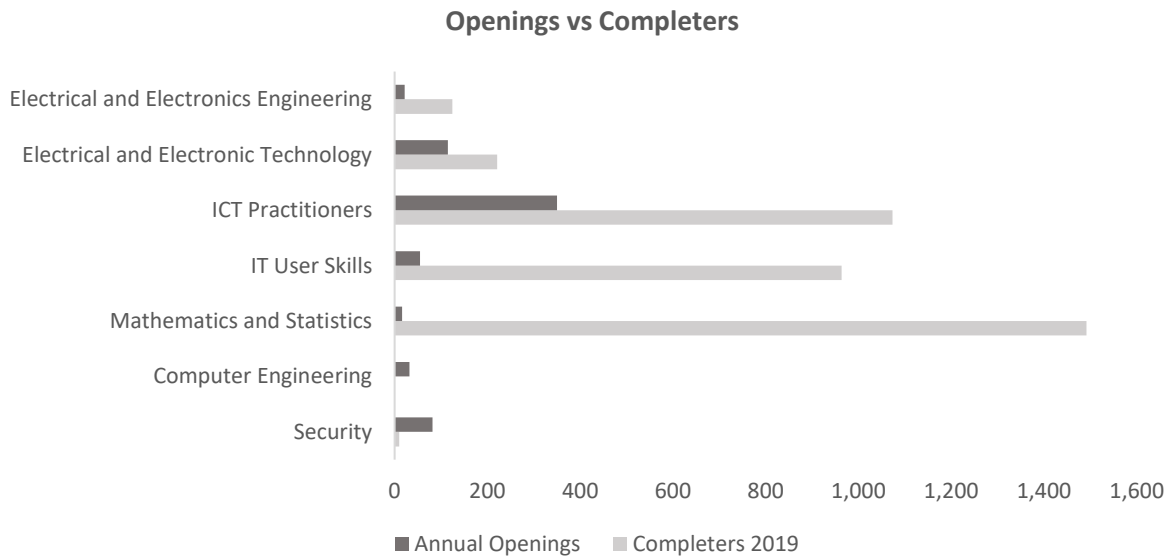
Threats (course areas that are well met or oversupplied compared to industry demand)

Disciplines with too much provision and not enough employer demand will lead to an oversaturated supply of labour in certain disciplines. Graduates from these courses will find it difficult to find

employment locally, and may have to move out of the area to find work in their field. People skilled in this discipline might have to upskill or retain in other disciplines to find work elsewhere. Courses in this group include those highlighted in yellow, e.g. mathematics and statistics, IT user skills, ITC practitioners, electrical and electronic technology, electrical and electronics engineering.

The best way to implement change is to prioritise interventions based on biggest misalignments and gaps. Disciplines with a low uptake e.g. those in blue, need extra resources to highlight the opportunities in these occupations.

These strengths, opportunities and threats can be clearly identified in the graph below.



Source: EMSI Analytics Tool, 2020

4.2. Future Drivers of Skills

Cyber security and resilience is a business enabler, as it allows organisations to enhance and embed trust in their operations, which is conducive to improved innovation and trade. Those seeking to defend organisations from damage must continue to embrace technological innovation to prevent, defend and deter those undertaking attacks. The UK Government's Technology and Innovation Futures sets out the core future drivers of change in the cyber security and resilience sector:

- Automation including Artificial Intelligence, Machine Learning, and Robotics, will alter employment. There is considerable potential for new jobs as a result of new technologies, including roles in designing, monitoring and repairing technology, engineering, machine learning and ultimately, supporting to ensure cyber security measures are in place. Automation within cyber security is fast becoming a core component of the offering. This may have significant implications for the cyber security sector, given strong employment and growth forecasts.

- Internet of Things (IoT) combines advanced analytics and a plethora of devices that connect together by communication technologies which allow for monitoring, collection, exchange and analysis of data of these devices to deliver valuable insights. IoT allows companies to build a data footprint through sensors and monitoring of equipment and machinery. This will enable

new business models which provides greater opportunities for the cyber security sector to work closer with industry.

The implications of technological innovation for the cyber security sector are far reaching. From a demand perspective, there is also expected to be increased interest within emerging sectors including advanced manufacturing, autonomous and semi-autonomous vehicles, agri-food, and health and life sciences – most of which have been identified as priority sectors for the Marches.

4.3. Impact of Brexit

The implications of Brexit on cybersecurity are as uncertain as the actual effects of Brexit on the UK. Industry experts remain none the wiser what the situation will be when Britain leaves the EU. This uncertainty comes at a time when the UK and the EU need to work together on cybersecurity more than ever before. Not only does the landscape of growing emerging threats demand they work together, there's also the fact that up to 30% of the EU's military capabilities are owned by the UK.

The recent Marches Growth Hub: Brexit Preparation Report didn't survey any cyber specific businesses from the Marches; however, they did survey 9 businesses from the information and communication sector. The findings seem to suggest that businesses in this sector have taken time to consider the potential impacts of Brexit. For example, 88.9% (8) of those from the information and communication sector reported that they had taken time to consider the potential impacts of Brexit on their business. None of the 9 businesses surveyed reported any concerns regarding Brexit.

4.4 Impact of Covid-19

Covid-19 is having and will continue to have an impact on all business sectors. Digital technology has helped businesses continue to operate by enabling virtual working and addressing skills issues through online tools and training opportunities where appropriate. Predicting how that might impact on businesses in the future is difficult but methods of doing business will change and in some cases that might alter the requirements on digital technology and change skills and training requirements.

The importance of the cyber-security and resilience sector in underpinning and driving digital working and automation will continue to be critical.

5. Conclusions

5.1. Summary

Simple linear trends (and data constraints) outline a forecast decline in the cyber security and resilience sector is forecast in the Marches. This is at odds with the Marches LEP's aspirations and the sector both nationally and globally is widely reported to be an area of significant *potential* growth. This growth is likely to be fuelled by the rapidly changing and expanding area of technological innovation to prevent, defend and deter those undertaking cyber-attacks.

Despite no agreed definition of cyber security skills or of a cyber security professional, the sector presents opportunities for the Marches, not just for economic growth at the sectoral level, but also through securing crucial technological developments across wider society, utilising local assets such as Cyber Quarter – The Midlands Centre for Cyber Security at Skylon Park.

For this expansion to occur the Marches will require more skilled workers to help organisations perform a range of cyber security functions. It will also require business to consider their cyber security workforce capabilities and capacity for now and in the future. If this demand for cyber security and resilience talent is not met, the sector may experience an inability to grow beyond a certain scale.

The Marches LEP has a clear ambition to be a digital leader and to build on its strong existing digital assets. The Marches Digital Strategy, particularly pertinent for this sector, but also cross cutting all other sectors, identifies key actions to realise this ambition.

5.2. Recommendations

To embrace this potential growth, key stakeholders and partners within the Marches cyber security and resilience sector need to consider:

- Adopting an agreed definition of cyber security and resilience skills, to help organisations better understand their skills needs, and individuals better understand their job roles
- Outline standard career pathways and relevant qualifications, to help further professionalise the industry
- Promote existing Government guidance on cyber security to encourage more organisations to better understand and address their skills gaps
- Focus on potential future skills needs by engaging with schools and promoting apprenticeships

5.3. Action Planning

It will be the responsibility of the Marches Local Enterprise Partnership (LEP) and its key stakeholders to review the recommendations, develop a strategy and agree an action plan to address the challenges and opportunities identified within this report.