GREATER MANCHESTER
DOING DIGITAL DIFFERENTLY

European Union
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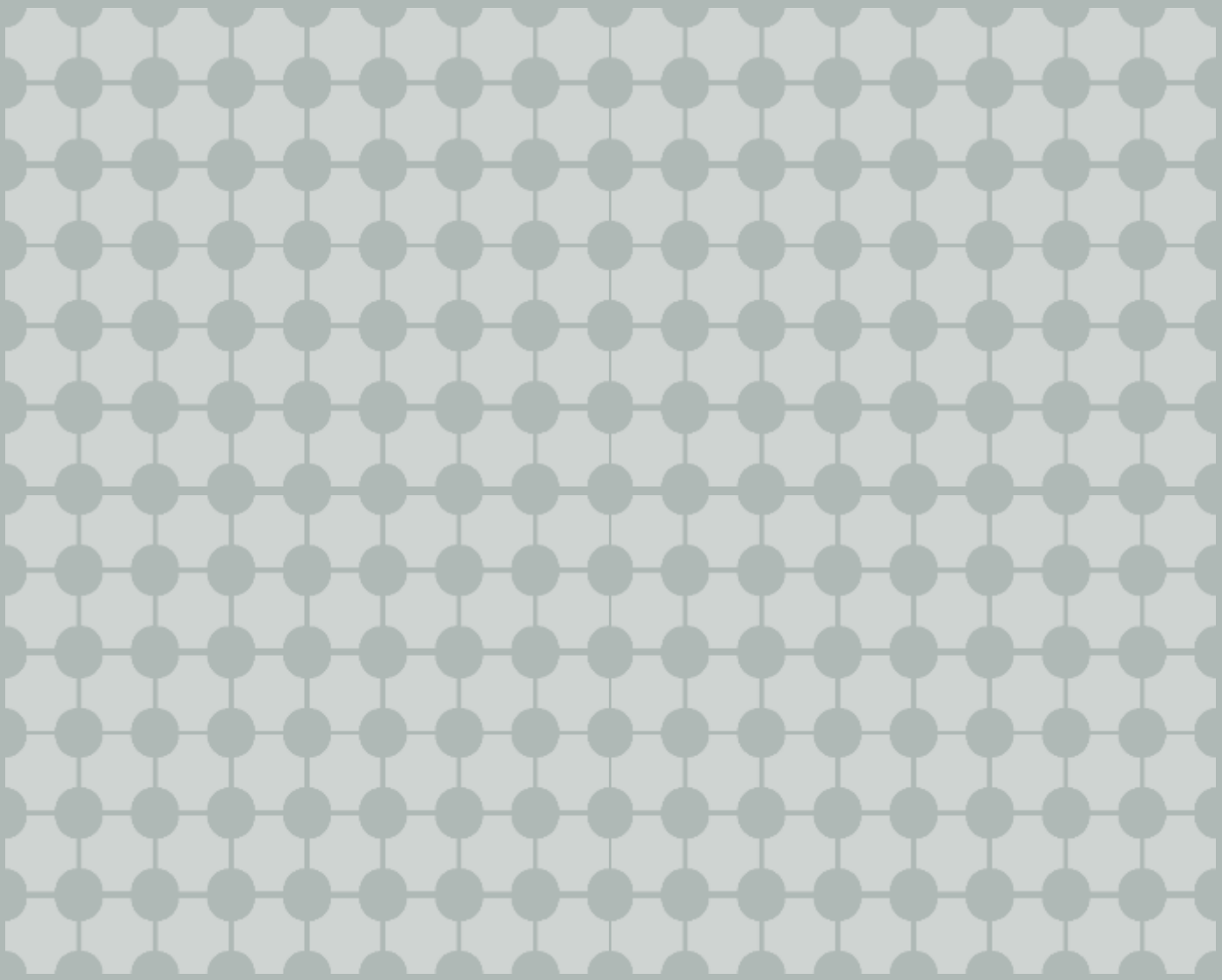
Social Fund

Industry labour market and skills intelligence report

Digital and technology version 1

December 2020



Contents

Subject: GM Digital and Technology Industry labour market and skills intelligence

Report of: Industry Skills Intelligence Team GMCA

Purpose of report

This report provides an employer led and current understanding of skills and talent needs across our digital & technology industry in Greater Manchester (GM). The intelligence has been gathered from a large variety of sources including discussions with employers of all sizes, existing employer networks and organisations who work with employers including but not exclusive of, Manchester Digital, MIDAS, Growth Company, and Local Authorities. Thank you to everyone who has contributed to this work, we hope you will continue to be involved in future talent development activity related to digital skills.

This intelligence is an accurate reflection of the labour market and wider skills landscape at the time it was published. It is a continuous piece of work which will iterate as the digital economy evolves and intelligence gathering, and dissemination is ongoing. The pandemic continues to shift the economy as well as digital transformation developing at a fast pace and GMCA understand the need to regularly update this intelligence accordingly.

This report supports and feeds in to wider GMCA policy and strategy including but not exclusive to:

- Greater Manchester Strategy
- Greater Manchester Local Industrial Strategy
- Greater Manchester COVID Recovery
- Greater Manchester Work and Skills Strategy
- The Greater Manchester Digital Blueprint

GM's Digital strengths and exponential growth in the sector, as well as increasing digitisation across all sectors presents real opportunities for residents. However, there is a need for residents of all ages to understand and be able to navigate their route into the digital industry, encompassing both the digital sector and digital skills/occupations across the wider economy. Residents need to be able to understand the occupations and progression pathways as well as the technical skills and wider competencies and attributes required in different areas of the industry and at different levels. There is the need for key stakeholders working with different groups to be able to translate these key skills and labour market messages for the following groups:

- Young people
- Influencers – teachers, parents, careers advisors and work coaches
- People looking to switch careers or looking for work
- Skills providers of all types
- Employers
- Individuals wanting to progress in work

For the initial version of the report, it was important to clarify the digital skills landscape in GM from an employer's perspective and begin to better understand occupational pathways and progression in areas where employers report the greatest demand. There will be areas which need further exploration such as creative and good practice related specifically to in work progression. There is more detail on next steps and future work at the end of the report and in the strategic summary.

Recommendations made as part of this report are intended to act as a catalyst for collaborative skills initiatives as well as provide strategic direction of commissioned skills and work initiatives where GMCA has devolved budgets. It is worth noting there is also a skills action plan developed as part of The Greater Manchester Digital Blueprint[1] and recommendations here help to take that action plan forward. A detailed action plan will be published to sit alongside this report early in the New Year 2012.

The vision for the industry labour market and skills intelligence work is to guide in the development of a fully aligned labour market response in GM where there is credible, current, employer led and shared understanding of the jobs, talent and competencies employers need across our Local Industrial Strategy (LIS) frontier and foundation sectors.

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[1] The Greater Manchester Digital Blueprint – January 2020

1. Executive summary

For some areas of the digital industry, it may not always be helpful or possible to try and present clear progression pathways to a specific job role

1.1. A key theme that emerged was that for some areas of the digital industry there are clear occupational routes into and to progress through the industry. However, in other areas of the industry progression pathways and specific roles are not clear and employers struggle to articulate specific preferred routes, instead preferring candidates to be able to demonstrate a core set of technical skills, competencies and wider soft skills and mindsets regardless of formal qualifications.

1.2. This has come about for several reasons. In some areas of digital such as cyber security and information security there is a lack of professionalisation of roles partly because they have and continue to emerge and change so quickly. This has led to no formal progression route and vast differences in role titles and job descriptions. Other areas of digital are responding to fast-developing technologies such as areas of big data and cloud. These challenges added to the high level of industry specific and technical understanding required by skills providers to translate what employers need make aligning curriculums and narrating the opportunities for learners in these sectors difficult. Skills providers need to be supported to work with industry.

1.3. For individuals of all ages and from all backgrounds whether they are looking to enter the industry for the first time in their career there is the need to translate this complex industry and support to navigate the best entry and progression routes for them. This report recommends using individual stories of those working in the sector to bring to life the different entry routes into the sector, something that has worked well in the recent Switch to Digital event aimed at individuals wanting a career into digital.

1.4. There is also a need for longer term support for those actively looking for routes in to help navigate the opportunities and present their skills and competencies in the way employers are asking for. There is a big opportunity for agencies such as Job Centre Plus and National Careers Service to upskill their advisors to help individuals navigate their way into the industry. There is also a role for mentoring, helping individuals access industry professionals and this should be better embedded into and used to enhance training and upskilling programmes.

1.5. Whilst the ambiguity around progression routes creates challenges, it should also be an opportunity to support individuals who's educational and employment background is less traditional. There is a real opportunity for

employers and individuals to maximise on the flexibility created by different entry routes and create diversity and social mobility.

Rather than what jobs it is sometimes better to understand the technical skills, competencies, soft skills attributes, and mindsets employers require at different levels of digital roles

1.6. If employers in certain parts of the digital industry are advising us not to simplify job titles and progression pathways where they don't exist, there needs to be another way to help individuals to navigate and narrate the sector in GM? This report starts to unpick the different routes into digital but also the specific skills, competencies and mindsets employers need and how these may be different as individuals progress from entry level to mid and senior level roles within the sector.

1.7. This report has worked with employers in GM's digital industry to group digital roles so that we can start to define how the occupational areas are different but also the opportunities to develop a successful career across different areas focusing on continually developing the technical and soft skills required to progress.

1.8. Anecdotally employers have often attributed failure of some bootcamp and short course type training down to the inability to successfully assess for competencies of individuals leading to inability to attract the right type of talent in the first place or individuals leaving with an inflated view of their earning power and the level of roles they are trained to apply for.

1.9. This report will highlight good practice where assessment of competencies and mindsets has been high quality and recommend that wider upskilling and training programmes adopt similar practice.

There is a strong desire by employers to increase diversity within their workforces

1.10. Almost all employers we spoke to have a priority to increase diversity within their workforce and that related to diversity in every sense in terms of background, gender, race, mindsets, age, ability and route into the industry. They strongly recognise the benefits that diverse teams bring to all aspects of their business.

1.11. However, there are some parts of the industry where work culture promotes long hours and pressured conditions causing high levels of stress. In conversations with employers this point was made about areas of cyber and specifically at senior level roles where there are talent shortages causing pinch

points. Manchester Digital's skills audit in 2020 reported 18% of individual respondents identifying as having anxiety or mood/emotional disorder.[2]A recent report into Diversity and inclusion in cyber showed 9% of their respondents are considering leaving their employer or the industry due to diversity and inclusion issues[3]. There is the risk in GM that if these issues are not tackled the industry will miss out on talent entering and progressing within the industry.

1.12. There are many examples in GM of good inclusive work practices in the digital industry related to recruitment, holistic training support and workplace practices, There is a real opportunity for the industry to use these examples of good practice so that they become more mainstream, as well as join them together to ensure where there is inclusive recruitment there are also work practices in place to support different groups to thrive within employment and talent is not lost because workplace culture does not support their wider needs or they feel like they don't belong on the company.

1.13. Businesses need support to recognise and embed inclusive practices in all areas of their business and understand that there are no quick wins to achieving a thriving diverse workforce overnight. Rather there needs to be recognition that culture and behaviour change happens slowly and involves everyone and may change the way their business functions.

COVID has been a catalyst for digital transformation across all sectors in GM; driving increased demand for digital skills

1.14. All sectors and sizes of businesses have been affected by the accelerated digital transformation caused by the pandemic. The types of skills needed are wide ranging and include:

- High level technical skills needed within existing IT teams in businesses especially around areas such as cyber, data analysis and software development
- Digital specific leadership and management especially around the more pastoral and wellbeing support and management of team remotely
- Digital skills for non-technical staff in businesses including albeit at a lower technical level than within digital specific roles; data analysis, cyber, User Experience and Digital marketing skills.

1.15. These needs were existing before the pandemic but have accelerated. There is a need within sales and marketing roles across various sectors from manufacturing to retail who are struggling with new skills required for

[2] Manchester Digital Skills Audit, 2020
[3] NCSC Diversity and Inclusion in Cyber Security Report,2020

ecommerce. SMEs specifically have reported consistently not being able to find the right provision which suits their needs.

1.16. Within sales and marketing as well as elsewhere the inability for staff to adapt to digitisation is no doubt having an effect on redundancies and there is an urgent need to support the upskilling of existing staff to stem some of this impact.

Recommendations and future reports

1.17. Recommendations in this report will be further worked on to create a detailed action plan which will be published in early 2021 and will set out how GMCA and other stakeholders can respond. This will include areas of commissioned skills delivery.

1.18. There are eight headline recommendations from this report:

1. There are areas of the digital industry where the region has skills shortages at scale and more provision is required to meet this talent need. These areas include highly skilled roles in: Software Development, Networking Engineering, Cloud Engineering, Data Analysis, and Cyber. Local/national funds should be aligned to meet this need.
2. Digital skills are needed in all sectors due to digital transformation. There is a need for “digital champions” in existing IT and wider non-technical roles to support with digital skills related to data, information governance, digital marketing, and digital finance applications.
3. With increased numbers of people in GM looking to switch to a role in digital, the industry needs to be encouraged and supported to develop more flexible routes into the industry building on the success and good practice which already exists.
4. The wealth of inspiration activity promoting digital skills and careers needs to be joined up for maximum impact, including shared messaging, targeting, and better signposting and transition between them.
5. The digital industry offers lots of opportunity, but it is complex, and some areas of the industry do not have clear progression pathways. Careers advisors and work coaches need support to understand the industry. Careers advice should be focussed on giving key messages around real life stories of those who have successfully navigated their route into the sector
6. Individuals who are looking for employment in the digital industry need greater support to be ready for a role in the industry. This should be embedded within skills and training programmes with links to employers and skills delivered through work-based scenarios set by the industry. There needs to be more transition activity supporting individuals from training into employment, preferably

by industry experts through mentoring activity which supports individuals with digital portfolio development, interview and CV techniques and navigating the sector.

7. Skills providers should be supported in understanding how training and skills programmes can be designed to best reflect needs of digital employers. A digital specific Quality Curriculum Criteria should be developed which supports skills providers to design skills models offering candidates the best opportunity to experience industry and develop the wider skills and mindsets they require.
8. Inclusivity should be embedded in all skills initiatives with programming designed to remove barriers to engagement and target specific groups who may otherwise miss out. However, to support the journey to a more diverse workforce in our digital industry GM employers should collaborate around good practice to develop a shared approach to inclusive recruitment and workplace practices.

1.19. This initial report does not seek to be a comprehensive assessment of cover all skills aspects and needs of the digital industry in GM. There is still much to do, and this will be a continuous process to assess gaps in progression pathways. Future areas of intelligence gathering will include:

- Skills need in GM's creative sector.
- Skills needed for progression within the digital industry in GM.
- Further work with employers around the 10 occupational clusters to explore technical, soft skills and mindsets required at entry level roles and progressive levels within each area.
- Skills needed for digital transformation in the public sector.
- Skills for FinTech as part of GM's wider professional and financial services industry.

2. Greater Manchester Digital landscape

2.1. The Greater Manchester Digital Blueprint[4] sets out GMs ambition to be recognised as a world-leading digital city region. It sets out the city-region's digital strengths as the largest digital and creative cluster outside of London, already world-renowned and creating £5 billion of economic activity through high value jobs each year and employing more than 86,000 people. Manchester has a thriving community of more than 10,000 digital and tech businesses, from start-ups and SMEs to global brands including Google, Microsoft, IBM and Cisco – as well as numerous homegrown unicorns that IPO above $1 billion.

2.2. In November 2020 a report by Tech Nation and job search engine Adzuna[5] confirmed that Manchester is the fastest-growing tech city within Europe, overtaking Cambridge for the first time to become second only to London in terms of venture capital investment in tech companies. Manchester was also ranked as the top UK city for IT professionals to live and work in the CompTIA UK Tech Town Index 2019[6], and the UK's top Digital Tech City in analysis of 29 cities by The Data City[7] based factors including strength of the business community and volume of industry-specific events hosted as well as affordability. The report found that GM performed ahead of all other major UK cities in fields including: AI and data; cyber security; Internet of Things; service design; and MedTech.

2.3. In the areas of e-commerce and digital security and trust in particular, GM's strengths and potential are such that we can become not only national, but global leaders. There are almost 3,000 eCommerce and related companies based in Manchester – more than 1,000 more than the next regional city.

2.4. The strengths of Greater Manchester's digital and cyber ecosystem and its diverse talent pool were key factors in GCHQ's decision to establish Greater Manchester as one of GCHQ's strategic national hubs alongside London and Cheltenham. The significant expansion plans of GCHQ in the area and associated increased investment that has already begun in the private sector, and in research excellence, support GM's ambition to become a world-leading cyber super-hub.

2.5. The GM Digital Blueprint also outlines Greater Manchester's commitment to innovative public services by applying exemplar digital ideas and practice.

[4] The Greater Manchester Digital Blueprint, Jan 2020
[5] Tech Nation - Jobs and Skills Report, Nov 2020
[6] CompTIA UK Tech Town Index 2019, Oct 2019
[7] UK's Top Digital Tech Cities, 2020

This creates exciting current and future employment opportunities to link innovative business, academic and public sector thinking with the needs of Greater Manchester's people to an extent not found in most other city-regions.

2.6. The city-region can boast a rich economy comprised of public sector, private sector. This business stock has been steadily increasing over the past 10 years. To support this rapid growth in economic output a rich digital skills ecosystem has developed with public, private, academic, and voluntary and community organisations all enthusiastic to work together to develop the digital talent pipeline. Our region hosts many strengths in digital skills provision with key skills and talent centres of excellence such as: UA92, ADA Manchester, School of Digital Arts (MMU) and a digital skills academy at Wigan and Leigh College focusing on the Internet of Things, to name just a few.

2.7. Digital and Technology remains a thriving industry, research done for GMCA on behalf of Geek Talent showed that throughout spring/summer 2020 although recruitment dropped consistently by a third overall due to COVID, Information and Communication vacancies remained the majority of roles on offer. The pace and scale of digital transformation driven by the circumstances of the pandemic have also accelerated some activities leading to expansion in some parts of the sector such as telehealth, e-learning, and e-commerce.

2.8. Most employers are prioritising increasing the diversity of their workforce. Employers were also clear that this is about diversity in every sense and not exclusive to gender or ethnicity, but also mindsets, background, age and more.

2.9. According to Manchester Digital Skills Audit[8] there is a stable gender balance issue in the sector with 32% of women accounting for all digital roles and only 16% of technical roles. This report is a small sample size but is helpful in giving a picture of what is happening in the industry. This is despite a wealth of activity over several years in supporting women to better understand the opportunity.

2.10. In GM employment in digital roles is dominated by those under 40 with 68% of the workforce within the age brackets 25 – 44 years old. This does confirm the impressions of some of the careers switchers attending the Switch to Digital Week who felt the industry was only for the young.

[8] Manchester Digital Skills Audit, 2020

2.11. There has been a slight increase in ethnic diversity within the industry, however the workforce in GM remains 81% white. BAME representation is largely from Asian/Asian British with fewer Black, Africa/Black British people.

2.12. Two Opportunities stand out for Greater Manchester. The City Region's broadcasting sector centred around MediaCityUK & the Sharp Project is internationally recognised and sits at the heart of a wider content creation and media sector underpinned by technological innovation. Secondly the cyber security sector is set to grow significantly – the direct and supply chain benefits from strengths in cyber security for residents, businesses and Universities are unique in GM.

2.13. Figure 1 below shows location quotient data for all 10 local authorities in GM. As a measure of specialisation, it shows Salford and Manchester have significantly higher proportions of people employed in digital and creative industries compared to the national average.

2.14. Smaller digital and creative clusters exist right across the city region; from the creative cluster in Ramsbottom to the emerging digital sector springing up around Ashton Old Baths. When speaking with local authorities they are all keen to make sure their residents take advantage of the regional digital opportunities and commissioned skills activity should consider local needs and ambitions.

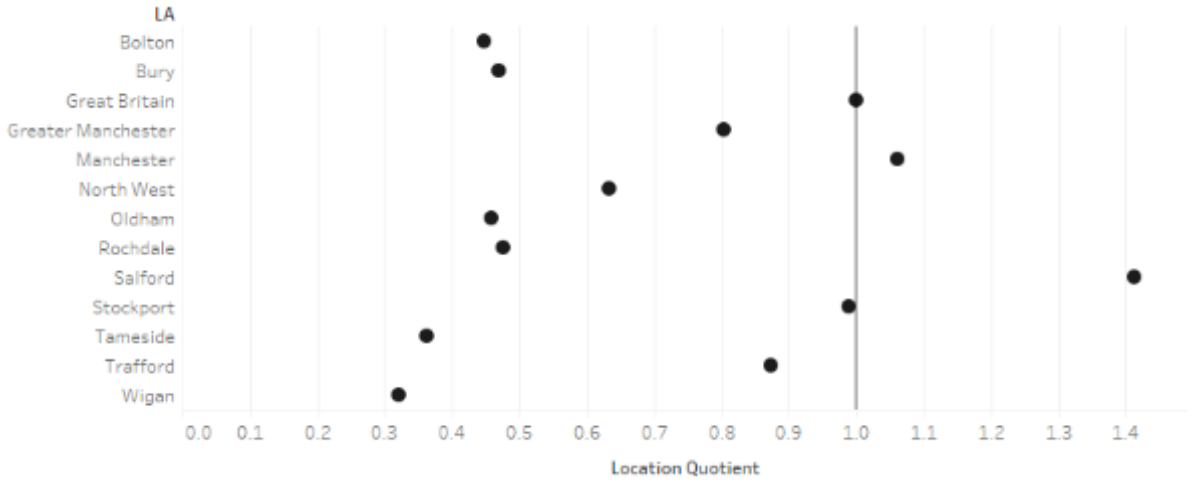


Figure 1 shows Location Quotient (LQ data) for digital and creative industries for each of the 10 GM local authority areas.

LQ is a measure of specialisation and demonstrates the prevalence of this sector in different geographical areas compared to the national average. Source: APS, 2019 and BRES, 2019

3. Impact of COVID on digital industry

Digital has remained a resilient sector in GM during COVID

3.1 Research done on behalf of GMCA by Geek Talent showed although vacancies in all sectors remained consistently over 30% down on pre-lockdown levels over spring/summer 2020, jobs related to Information Technology consistently outnumbered vacancies in other sectors (See figure 2 below) with GM consistently seeing a higher market share of Information and Technology related vacancies compared to elsewhere in the UK (see figure 3 below). ADZUNA data showed the most live job adverts in GM in November were for IT jobs. Fin-tech, e-commerce, e-learning and online radio are areas of the industry that have adjusted particularly well whilst digital agencies & travel companies have found it tougher to pivot their offer.

3.2 The digital industry has significantly higher than all-sector average proportion of self-employed and freelancers (especially in the more creative areas of the industry) who have struggled disproportionately during COVID without many of the benefits of being in a larger employer and some unable to access central funding on offer. It is too early to predict with any certainty how this will affect skills needs, but as an important feature of GM's digital industry this should be considered in future reports.

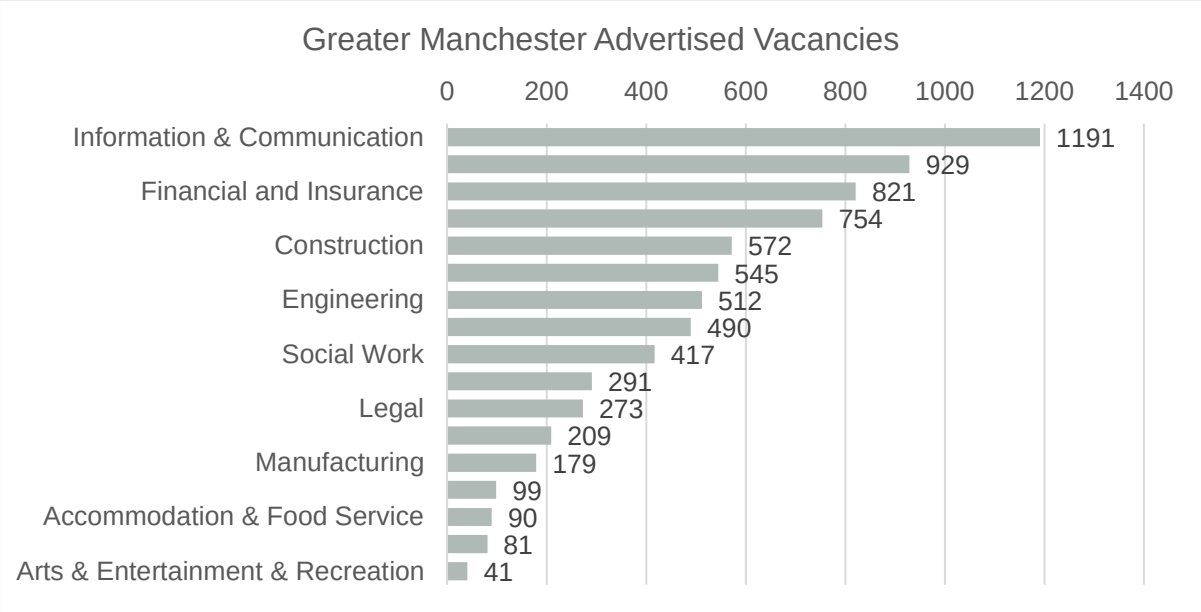


Figure 2 Geek Talent data showing job vacancy sector totals for the week ending 1st August 2020.

This trend of Information & Communication vacancies making up most vacancies was seen consistently throughout spring/summer 2020.

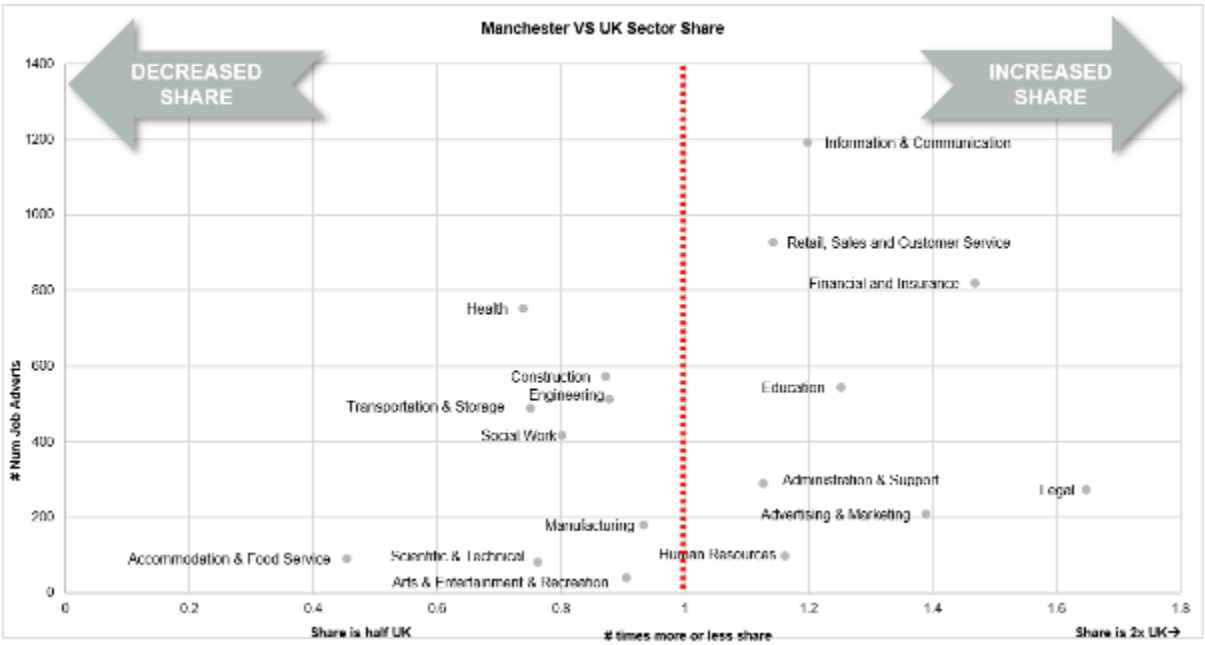


Figure 3 Geek Talent data showing Greater Manchester Vs UK job market share of job vacancies for the week ending 1st August 2020

Information & Technology vacancies in GM saw a consistently bigger market share than elsewhere in the UK.

3.3 Although the IT sector in terms of job adverts has remained the most resilient over COVID and anecdotally many employers have reported significant growth it is worth saying this is not universal. In conversations with digital employers, it was a mixed story with some large GM based businesses reporting redundancies of up to 25% of their workforce. Many reported simultaneous growth in some areas of their business and redundancies in others. Others are seeing the opposite and growing beyond all planned recruitment before COVID, with one reporting growing from 8 – 28 in the sixth months since March 2020. There was also uncertainty with ongoing restrictions and the impact on their business, therefore, this continuing shifting economic landscape needs to be considered carefully when translating the intelligence in this report to various stakeholders.

3.4 Where employers were recruiting, they reported recruiting at all levels including many making senior appointments which would normally not be expected in an uncertain time suggesting people in higher level roles are confidence in committing to a new role during this time.

3.5 Many employers were reporting a resistance of their workforce to come back to the office as restrictions were easing in September, suggesting the workforce were keen to continue to have the option of flexibility afforded by home working. This is a national trend, ONS survey showed 49% of adults in employment in Great Britain worked from home during lockdown, compared to 5% of the workforce that worked mainly from home during 2019. Skills implications are likely to be around effectively managing teams remotely and supporting junior staff members to learn form more experienced staff when there are fewer chance encounters to share knowledge in an office environment.

3.6 Employers agreed that where they were still struggling to recruit talent and had unfilled vacancies were in more senior digital positions. Where some employers were being able to successfully fill vacancies at senior levels some reported recruiting talent elsewhere in the UK with permeant positions working from home in roles which would previously have required them to work from GM based offices. They reported the benefits of opening-up the market for talent which could have the effect of increasing competition for reginal digital talent looking for employment opportunities.

3.7 In June 2020 jobs in software development accounted for the majority of job vacancies accounting for a huge 47% of all digital vacancies as shown in figure 4 below. Other job families where there were large numbers of vacancies are data, with analysts, engineer and scientists appearing most often in adverts. Job adverts in software development specifically highlighted the need for PHP, Java, C#, python and React skills. Network Engineer skills, specifically DevOps and Cloud (AWS) remained consistently in demand as did operations support.

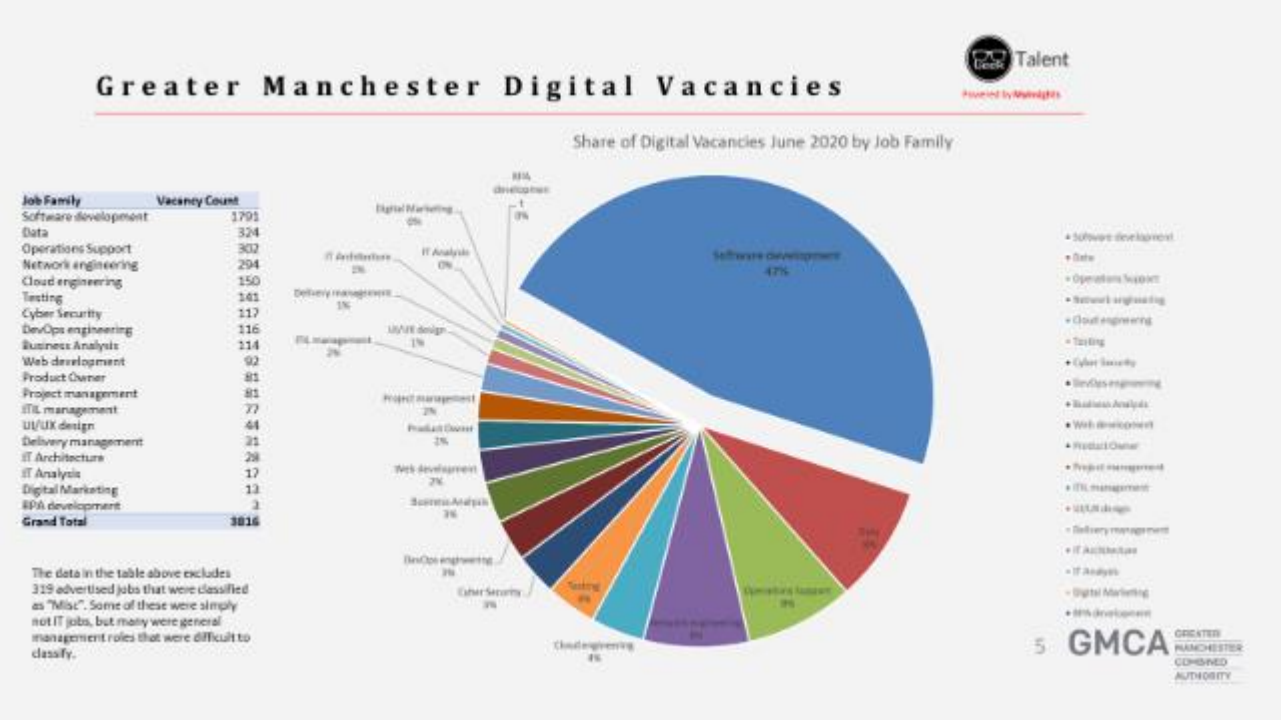


Figure 4 Geek Talent data Showing the breakdown of digital job vacancies in June 2020

Rise of residents wanting to switch to digital

3.8 Even before the pandemic Manchester Digital's annual digital skills audit 2020 reported 41% of their respondents were transitioning into tech careers moving horizontally from one career to another or have retrained. COVID has increased the number of people looking to transition from declining sectors to the more resilient digital sector. Figure 5 shows Manchester's declining and growth sectors where we are likely to see people looking to transfer their

existing skills and competencies and upskill where they may need new technical skills.

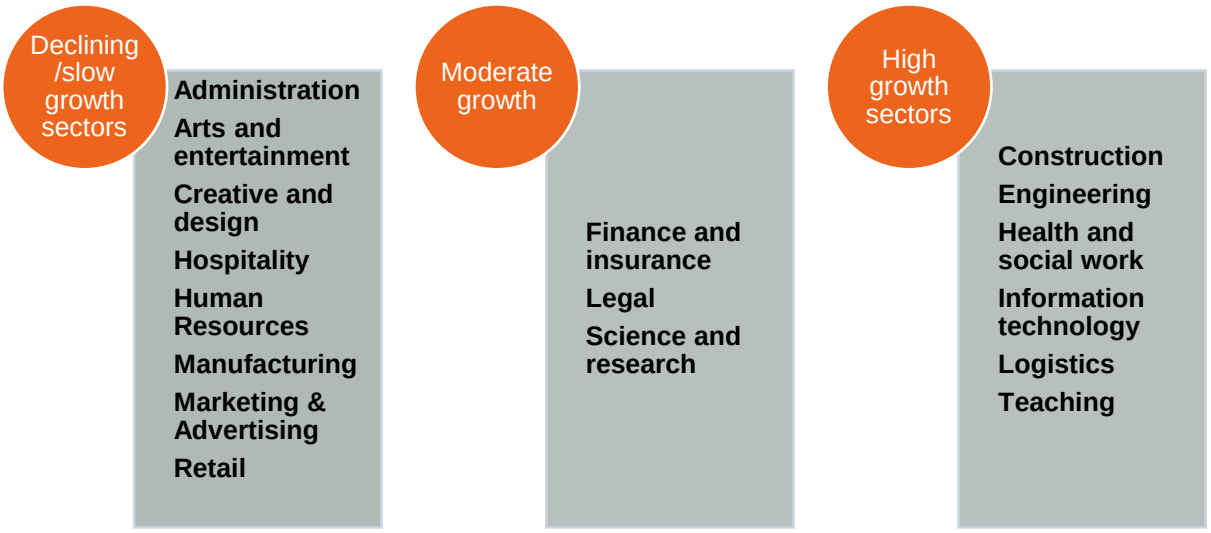


Figure 4 Geek talent data shows the current sector split in GM of declining, moderate growth and high growth sectors.

3.9 The recent Switch to Digital event in October 2020 saw higher than expected registration of 649 people looking to switch or reskill many older entrants. Attendees to the session perhaps unsurprisingly stated that they currently worked or had most recently worked in declining sectors including Arts & entertainment e.g., music, Creative & Design e.g. TV, Hospitality e.g. night-time economy, travel, events, Administration / Office Work, Physical retail (as opposed to e-commerce), Advertising & Marketing. However, there were attendees looking to switch from moderate and high growth sectors including: Science and research, legal, finance and insurance, energy and other areas of Information Technology.

3.10 This event resulted in insightful intelligence around those looking for careers in digital now across GM including:

- Most of those attending (over 38%) were between 31-40 years old with the next highest age bracket in attendance (at 26%) between 41 – 50. A key perception of those attending was that jobs in digital were for the very young and there were fears that workplaces may not be for them. They had a similar view of training and wider support on offer.
- Attendees most valued the opportunity to link with industry experts and found this useful in understanding the routes into and through the industry from people who had been through the process themselves.

- Attendees clearly valued the wider reading and signposting to training and events they had found useful in helping them identify what employers are looking for amongst the wealth of content available.
- Participants in the week felt they needed more support to be employer ready including mock interviews, CV, and assessment centre training.

3.11 Pathways such as apprenticeships and bootcamps are viable pathways for career switchers as well as the younger school and college leavers and need to be promoted as such to the wider population.

3.12 If there are to be opportunities for career switchers supporting the COVID recovery it is important that there are entry level positions across the different areas of digital. Data gathered for GMCA by Geek Talent analysed job vacancies to understand where entry level opportunities are available across different sectors see figure 6 below. This suggested that although digital is a growth sector there appears not to be the entry level opportunities – just 1.85% of overall vacancies compared to logistics, also a growth sector, but were there are double the entry level opportunities at 4. 68%.

3.13 There are caveats around how “entry level” was defined in the data collected. Employers also explained other factors which would prevent entry level roles may not being captured in this data, including word of mouth preventing roles needing to go to advertisement publicly.

3.14 Anecdotally this data also contradicts what we heard from some employers. Many reported where there were vacancies, they had been inundated with graduate applications areas such as project managers and product owners were given as examples. Many were still recruiting a normal or slightly reduced graduate intake with many taking time to develop a high-quality recruitment and onboarding activity online.

3.15 However, it must be considered that if we are looking to transfer GM residents into digital careers as part of the COVID recovery process we must ensure there are the initial routes into the industry at the right level of skill level for those applying for roles. We know a likely COVID impact will be graduates taking non-graduate roles, further squeezing the number of opportunities for those less qualified. Employers and individuals need to be appropriately supported to create these opportunities and be best paced to take advantage of the opportunities respectfully.

3.16 Data on 2019/20 apprenticeship starts are unavailable at a local level and it may be too early to fully understand the impact of the pandemic on apprenticeship starts across the digital industry. Although it is likely data will show a reduction and delay in apprenticeship starts, anecdotally more businesses than expected have been interested in continuing to recruit new apprenticeships and continue to train their current apprenticeships. This is likely due to the overall resilience of the sector. Colleges have seen central government interventions to support technical education are having a positive impact and Universities have reported a big rise from employers.

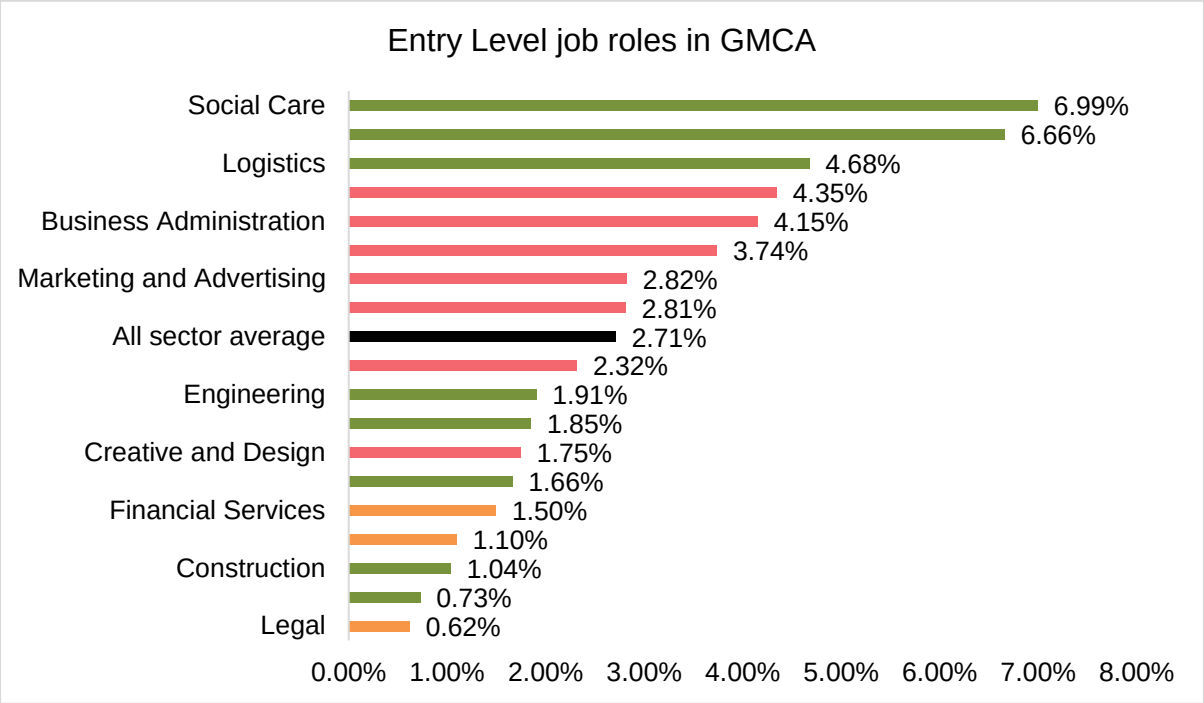


Figure 5 Geek Talent data to analyse entry level roles in different sectors.

Data suggests that although digital remained a growth sector during the pandemic there are likely not enough entry level opportunities to support demand.

- We analysed over 200,000 job adverts in GMCA since January 2020 – less than 3% on average are classified as entry level
- Entry level roles were first identified based on keywords in job title (e.g., trainee) or phrases in the job description (e.g., entry level role, level 1)
- Higher salaries among the selected roles were used to remove mis-identified roles
- Jobs with low salaries were reviewed to identify additional entry level roles

Digital transformation across sectors

3.17 Digitisation of sectors requiring new skills is not new, but the pandemic has proved a catalyst for change across sectors merging the need for digital skills more than ever across all sectors including high level technical skills needs. This transformation has affected all businesses irrespective of sector or size and with digital skills needs reported at all levels.

3.18 Small and medium sized enterprises (SMEs) have been particularly exposed where there are IT roles and even non- IT specialists who normally take on multiple roles due to the size of the business are finding themselves responsible for information security, navigating new digital marketing and sales platforms, digital finance as well as softer skills for line managing home workers.

3.19 Throughout the pandemic 4 priority skills need areas linked to digital transformation have persisted amongst SMEs in all sectors including:

- Sales and marketing
- High level technical skills such as data and cloud skills
- Leadership and management
- Digital skills

3.20 IT specific roles need support in accessing the high-level technical skills emerging as gaps in their businesses areas such as cyber and information governance, data analysis, and managing and building new online platforms to support their businesses to engage with clients remotely.

3.21 Sales and marketing skills have been consistently stated as a skills gap with challenges around managing clients and sales overall. Businesses have found themselves with lower sales overall and struggling with areas such as customer care, account management, upselling and seeking new clientele all on online platforms which for many staff is a very new way of working. New skills supporting knowledge of ecommerce and digital marketing and User Experience skills are required to support business to upskill. Employers have reported it difficult to find the right training in this area and report that they would value informal mentoring to upskill.

3.22 Leadership and management have been another consistent skills gap and when this is unpicked with employers often means a variety of different things which come back to the speed of digital transformation. Examples include:

- Managers and leaders in sectors where homeworking is not a possibility have found their workload increasing with new compliance procedures and work rotas often having to manage homeworkers as well as staff in the workplace. Dealing with HR issues and care of staff general wellbeing remotely challenging skills needed for good leadership.
- With new online platforms replacing face to face transactions there is emerging needs around areas of FinTech, data analysis, cyber and information security.

4. Employer skills needs

Digital skills most in demand

4.1 The Digital and Tech industry continues to evolve at rapid pace, and whilst the events of 2020 have impacted the industry, overall, the industry appears to be recovering well with recruitment rates rising again. In the previous part of this report there was data to show the top 5 in demand digital role families were:

- Software Developer
- Data Analysts
- Operations Support
- Network Engineering
- Cloud Engineering

4.2 From conversations with employers' high-level technical skills are still in demand across the sector with demand at mid/senior level roles particularly in the below areas:

- Software Development – especially back end development
- Software Delivery / IT Networking – especially Dev-Ops, agile roles, Cloud Engineers & Network Engineers
- Data roles including: Scientist, Analysts and Engineers
- Cyber roles including: Cyber Security Analyst, Penetration Tester, Cyber Security Architect, Cyber Security Researcher and DevSecOps Developer

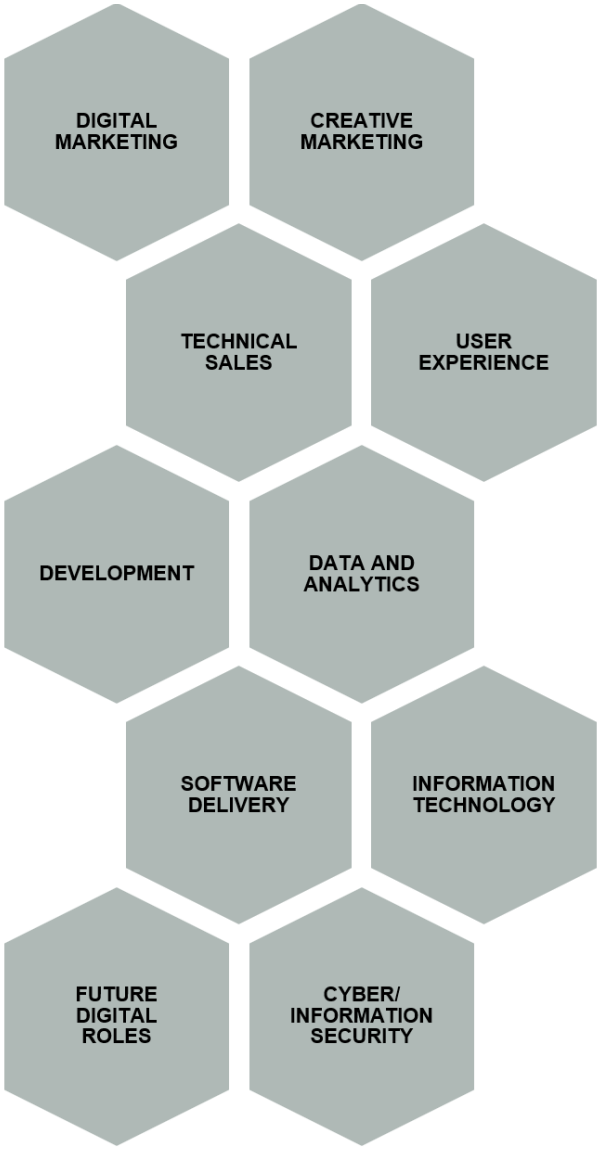
4.3 There is a growing need for IT teams in digital and wider sectors to develop more highly technical skills to support the current work of their teams, creating "champions" with some of the higher-level technical skills in areas such as:

- Data analysis
- Technical sales
- Cyber/ information security
- FinTech

4.4 Like the above but across non- technical digital roles there is the need for similar "champions" to support emerging skills gaps across sectors such as sales and marketing to manage new online platforms for sales. These champions will be needed in areas such as:

- User Experience
- Cyber/information security
- Data analysis
- Digital marketing and creative marketing
- FinTech
- Leadership and management – good practice virtual management of teams

Figure 6 shows the 10 areas of digital occupational clusters in GM developed with employers.



Progression pathways in digital careers

4.5 A key objective of this report was to be able to better articulate different sub-sectors within the digital sector in GM and articulate jobs and progression pathways within those different areas. This provides a way to start articulating the digital industry to individuals who may want to take advantage of this growth sector by providing a clear line of sight and signposting to high quality skills provision.

4.6 Employers were involved in discussions to come to an agreed understanding of how the digital sector could be broken down into digital clusters.
Appendix A sets out this work in detail which breaks the digital industry down into 10 occupational clusters see figure 7 below.

4.7 Appendix A includes details on different roles, progression pathways, skill requirements, average salaries, links to occupational maps and wider intelligence about the occupational clusters in GM based on employer conversations. This intelligence will be further developed with employers and used to translate this intelligence with key stakeholders such as young people and their influencers, careers switchers, job seekers and skills providers.

Challenges in creating clear progression pathways in digital

4.8 Despite the existence of occupational maps set out nationally by employer boards on behalf of The Institute of Apprenticeships and Technical Education (IfATE) there was a mismatch between how GM employer's choose to break down the sector in terms of job roles. This needs to be considered when narrating opportunities with skills providers especially.

4.9 When speaking to cyber and information security employers there was a real challenge in trying to articulate role titles where there is lots of overlaps and lack of agreement on preferred progression routes into and through the sector. This was not the only occupational area where employers warned against trying to simplify pathways for individuals when the reality is the skills landscape is complex and efforts may be better places supporting individuals to navigate the opportunities.

4.10 When digging deeper with employers there are many different reasons why some do not want to be pinned down to preferential routes or specific qualifications. Key themes included:

- Lack of professionalisation of some roles. Especially true for cyber where the sector has developed at such speed and roles are changing all the time there has been no regulation. Despite the high accountability and risk involved in these highly technical and specialised roles there is a lack of regulation and minimum skill requirement equivalent to what we might see in sectors such as health, law, and accounting. This in turn provides skills challenges in assessing if individuals have the skills required for specific roles and individuals seeking high quality training to progress into senior positions.
- Overlapping digital skills and competencies required. Different areas of digital overlap and depending on the size of the business employers may be looking for individuals with multiple areas of expertise. Based on conversations this is likely to grow. Examples include the close links between cyber and cloud engineering and the increase in employers looking for individuals with a good mix of front end and back end developer skills. Data analysis was another area where employers would ideally look for individuals who have the skills to perform both analyst and engineer roles.
- Fast moving technology and therefore job roles and skills needs. This is particularly relevant in areas of network and cloud engineering as well as data analysis where technology is changing at such a rate employers struggle to articulate the skills, they need let alone skills providers being able to update curriculums and offer up to date careers advice.

4.11 Employers preferred to look at progression in terms of individuals developing through digital roles from entry level to junior roles to mid and then senior level roles. Some employers were keen to stress that for digital and especially areas with high level technical need, entry level is likely to be graduate level and a junior role could be accessible after a few years on the job experience with mid-

level and senior level roles requiring further training, specialisation and years of experience within the industry

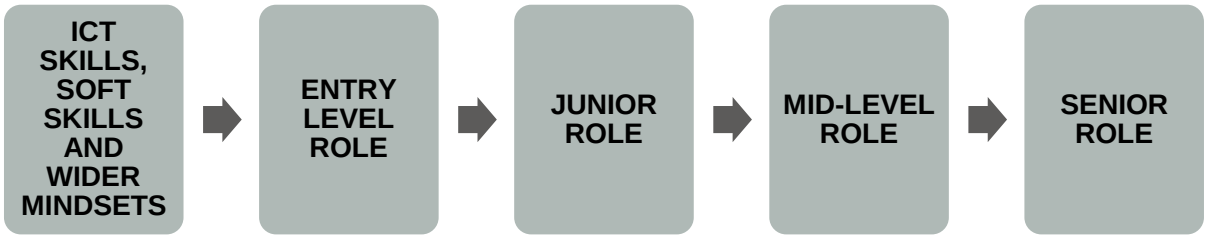


Figure 7 Different levels of progression within the digital sector

Skills gaps in wider non – technical skills, competencies, and mindsets

4.12 A trend across the industry was the need for particular types of mind-sets and attributes required to progress to senior level roles. There is a particular type of dedication and resilience required to continue to learn and proactively seek out new trends and technology developing within the areas and access often self-taught upskilling opportunities to develop the specialist knowledge required. To successfully navigate career progression opportunities individuals, need to be proactive in building a variety of networks.

4.13 A concerning observation from employer conversations was not necessarily the lack of interest from seemingly qualified individuals often graduate applying for roles. One cyber employer reported 200 graduates applying for one job. However, candidates were not able to demonstrate their technical skills and wider competencies through real life examples. Several employers cited that building a digital portfolio and GitHub as a good example of how to demonstrate technical aptitude. However, there is also a need to develop a richer portfolio which addresses examples of individuals meeting wider competencies the digital industry needs such as managing workload, resilience and self-drive and the ability to collaborate and communicate new ideas. One employer described it as not being a glossy physical document to present at interview but a log of real-life experience. Universities and employers need to be supported to collaborate on this issue to produce employable graduates.

4.14 Alongside good technical fundamentals digital employers were looking for common non -technical skills and attributes including:

- Self- driven and ability to show tenacity
- Collaboration
- Communication - people happy to bring new ideas and communicate problems simply
- Personal organisation

- Willingness to carry on learning and developing

4.15 There are emerging examples of employers finding candidates with the core ability but who preferred to recruit based on softer skills and competencies and then delivering the technical training in house. For many this still required a degree level qualification, but in many examples, it didn't matter if that was a science, technology, engineering and mathematics (STEM) or non-STEM based degree. Examples were also given of gardeners moving into cyber roles and career switchers with project management experience coming in and leading digital teams.

Need for diversity

4.16 Developing the talent pipeline and promoting diversity within the industry means creating inclusive practices at all levels of skills development right through from inspiration activity, to signposting to skills provision, delivering training, seeking employment, and remaining and progressing within work. Every aspect of this pathway must be addressed if we are to reach groups that could most benefit from the opportunity our growing digital industry has to offer.

4.17 All employers we spoke to were looking at ways of increasing the diversity of their workforces. This has moved on from addressing gender imbalances and employers are looking for diversity in the widest sense weather that is gender, age, ethnicity, background, education. What was of value to employers was having individuals who could look at the business and teams within it with a different lens. One employer quoted quite simply:

"Diversity will better serve our customers and develop better products"

4.18 There are some excellent examples of skills provision targeted and designed with holistic wrap around support to ensure it is inclusive for learners facing barriers. Examples include: Tech Returners, which supports skilled tech professionals returning to the industry after a career break accessible opportunities to refresh their skills; and Recode, based in Bolton, which provided free coding courses in 2019/20 to individuals who belong to under-represented groups within the technology industry and to anyone for whom adversity or financial hardship acts as a barrier to entry. There are also examples of innovative recruitment practices which prevent unconscious bias towards candidates.

4.19 There is also work being done to change the culture within certain areas of the digital industry which will improve workplace practices and support people to develop who may otherwise have other commitments outside of work.

Case study - diverse hiring practices

Rosie Anderson, Independent cyber and tech recruiter GM

Rosie Anderson believes recruiting on competencies and mindsets rather than just technical skills is key to bringing diverse talent to the industry.

A defence client was looking to improve diversity within their security team. whilst also looking to fill some difficult cyber security vacancies, which had been open for some time. This business is experienced at training and upskilling staff, and also offers flexibility around working hours and working locations, so had a lot of the internal infrastructure already in place for a returner programme.

Working with their recruitment partner, Rosie Anderson, they designed a potential hiring programme which would be able to reach out to a wider community of technical returners.

Over 100 applicants were approached and assessed against a wide range of transferable skills, as well as eligibility for security clearances. Faith was put in the recruitment partner to benchmark these skills, as well as suitability for the client's defence environment, as the client would not see any cv profiles until after the assessment day, to ensure no unconscious bias.

An assessment day was then held and attended by 12 ladies, which focussed on team work to solve a murder mystery, then individual assessments to map out the engineering mindset, by focussing on a connected smart fridge to find the potential vulnerabilities. Rosie Anderson believes recruiting on competencies and mindsets rather than just technical skills is key to bringing diverse talent to the industry.

Following on from this day, two ladies were hired. Both ladies had been out of the technology industry for over 5 years and had not worked in technology or cyber security. Both ladies are now thriving within their respective businesses, despite working remotely due to COVID.

4.20 There is also work being done to change the culture within certain areas of the digital industry which will improve workplace practices and support people to develop who may otherwise have other commitments outside of work.

Case study – developing cybersecurity skills within development teams

The perception of cybersecurity even from within the rest of the digital sector is mixed – many developers, designers, project managers see the security challenges as an obstacle.

As a result, it is often treated as an afterthought in many development projects, increasing security risks and increasing both the cost and time of testing and fixing. Aside from these immediate impacts, it often creates an acrimonious relationship between cybersecurity professionals and the rest of their teams.

Digital Interruption are a consultancy who support organisations to solve this. Their solution to the issue is to introduce tools and training on security for all staff earlier on in the development process – designers, developers, testers. Working with any project that has a development pipeline, the idea is to distribute responsibility for security throughout the process. By teaching development teams some of the common flaws in different systems, they will start to build more secure systems by default. This will improve the burden on security professionals and create a more cooperative environment.

Through this shift, the role of cybersecurity experts changes to be more advanced and more specialist. Because the overall standard of security improves, the cybersecurity team tend to perform smaller and more targeted testing, which can affect small areas of the system, as opposed to needing full redesigns. This approach will also change the skills profile of the workforce, enabling more individuals to get an understanding of what the cybersecurity roles are like and to weigh it up as a progression route in their future career, therefore, potentially creating a new talent pipeline.

Workplace practices

With regular long hours, on-site working involving travel and overnight stays, and high levels of stress, the cybersecurity sector has gained a reputation for tough working practices. Digital Interruption are also working to improve these working practices, focusing both on the mental health and wellbeing impacts of work. Introducing new flexible working hours, fewer on-site visits and an understanding environment, they have improved the work-life balance of all of their employees. Supporting this, they promote these principles among their peers, clients and customers at industry events.

Some of the new principles they propose for businesses include:

- "*Ask your staff*", where companies will trust staff to come up with solutions themselves instead of directing in a top-down manner, allowing for creative problem-solving.
- "*Enforce good policies*", where well-written policies around working practices and adherence to them are paramount – loopholes and non-adherence result in stress and distrust.
- "*Don't buy in bad practices*", where culture and working practices are passed up and down the supply chain, hopefully inspiring more companies to make similar changes.

This understanding that individuals are the most important resource for a business is a growing trend across all sectors – Digital Interruption are leading this among the digital sectors. With cybersecurity in particular becoming ever more important for all areas, this work will help to promote best practice principles, resulting in an increased job satisfaction for those already in the sector and will contribute to improving the recruitment and retention for many digital businesses.

"We trust our staff – we give them the autonomy to be able to make their own decisions" *Saskia Coplans, Digital Interruption*

Digital and creative

4.21 The following intelligence was gathered by The School of digital Arts (SODA) at Manchester Metropolitan University in August 2020. They brought together employers working across GM in areas of Content Production, Digital Agencies and Tech (CDT) industries through a series of roundtables. This intelligence was based around the skills needs for "future storytelling" builds on MMU's strong employer led approach. In this instance intelligence was gathered to specifically inform their Continued Professional Development CPD programme.

4.22 Although this report does not cover digital skills within creative industries in any depth. This intelligence is relevant to the current digital skills needs to support the sector and so it has been included.

4.23 Industry specific leadership and management skills needs was a consistent theme throughout discussions and not unique to SMEs. Employers felt that COVID had shed light on this need with some managers struggling with remote management of teams and support of staff wellbeing. The skills gap was often attributed to digital and or creative specialists progressing quickly in growing businesses and finding themselves leading staff or even businesses with no formal training. Skills reported most in need were good people management, especially remotely and dealing with HR issues especially around inclusive recruitment practices.

"Off the shelf training won't work – so a specially modified digital leadership and management course would be good"

4.24 Employers felt developing these skills should be embedded in skills development at all levels supporting the development of teamwork and leadership early on.

4.25 Leaders within the industry wanted coaching and mentoring to support their staff with ideas creation and disruptive innovation to support their businesses. They felt leaders had created set ways of working within the industry and needed to be able to break the mould and support their teams to think differently.

4.26 Areas of high skills demand were in production and technical skills across broadcast media, games, digital agencies, and even broader sectors. They felt the production process needed demystifying often because jargon and terminology used can be used differently by different areas of the sector and this is acting as a barrier to individuals recognising their transferable skills as well as off-putting to new entrants. There was a need to support digital

specialists to apply their skills to creative ideas wider than just technical applications.

4.27 Employers recognised the benefits and need for individuals with a range of skills and different backgrounds, however they felt that the lack of formal recruitment processes and lack of long-term strategic skills planning was letting them down. They also felt that to address the sectors equality and diversity issues there may need to be more flexible approaches to training funding.

4.28 Some employers felt that graduates could often lack applied knowledge and the rate of digital transformation made it difficult for curriculums to keep up to date. employers welcomed a facility such as SODA as an interface for collaboration between academic learning and business, providing a platform for knowledge exchange.

4.29 Employers were able to articulate that there is a changing media business model causing storytelling to converge around technologies and platforms originally developed for games. There was a sense that broadcast, media, film, and television may not be keeping up or keen to recognise this new way of working because it will challenge the status quo especially in terms of funding.

4.30 Stakeholders needed flexible solutions to training extending delivery methods beyond the classroom and incorporation more peer to peer and group learning which always reflects a real-world scenario and working environment. Employers needed skills development to work around their commitments with more opportunities to engage in evenings and at weekends as well as access to an online offer.

4.31 Timing of skills delivery was key for the CDT employers involved. With economic uncertainty caused by the pandemic as well as BREXIT it was felt creating strong leaders was a priority area with skills needs related to better storytelling being better delivered when employers were out of wider priorities around survival of their businesses.

4.32 A national report by Screenskills[9], the sector skills council for the audio-visual industries carried out workforce research and identified 5 skills need areas for digital including:

4.33 Automation Developments in technology are affecting the way the industry works with areas such as highly developed automation, robotics and sensor led technology and 3D printing given as examples. There is concern in the sector that AI may replace some roles for example craft roles, but there are other areas which AI will not be able to replace for example arts officers, producers, directors, AV operators, actors and entertainers.

[9] ScreenSkills (2020). High-end television in the UK: 2019 workforce research.

4.34 Advanced Digital skills Digital transformation will affect all areas of business for example marketing, HR and finance where new skills will be needed including high level specialist roles for example cyber and information security expertise. Screen industries also need support to exploit big data with data analyst skills in short supply.

4.35 Fusion skills Research showed the increasing need for individuals who can converge their technology and creative skills within roles. There was also convergence of different parts of the industry for example blurring of film TV and games and the ability to blend virtual and live experiences.

4.36 Global skills This is not a new trend but may be accelerated due to COVID. Evidence shows there will be a greater need for inter-cultural awareness and sensitivity and an ability to work and communicate with a wide variety of people.

4.37 Specialist skills These are areas where automation and outsourcing are less likely to have an effect and will include skills in areas such as: Drome operators, VFX and specialist affects, riggers, animation, post-production, computer programming and big data roles.

4.38 Leadership and management the report highlights this is a widespread issue within the industry fuelled partly by areas of skills need where lower skilled individuals are progressing within a sector without the fundamental skills or training. Specific areas such a creating and managing budgets and line management were highlighted.

5. Digital skills provision

5.1 Not a new finding by any means but employers are still reporting that certain forms of provision does not match their need. However, GM has made progress in creating a more aligned skills system for digital with many employers valuing alternative routes which are working including various training and bootcamp programmes as well as apprenticeship routes which provide the opportunity for employers to shape talent to their specific requirements. There are some great practice examples in GM for example Tech Returners and Code Your Future just two examples which are increasing diversity in the industry.

5.2 In discussion with cyber employers – they reported no shortage in graduates applying for roles, but they cannot show they are ready often able to demonstrate their skills and lack wider skills and mindsets – courses are insufficient. Reportedly it is wider than getting the degree: hands on experience, building a portfolio, and what they have done in practice is important, not just what they studied. This goes beyond technical – can they write a report for

example. Demonstrable practical work which students can showcase their capabilities. GM's Higher Education Institutions (HEIs) should consider how they can support graduates to develop portfolios.

5.3 Across digital roles in general employers did not necessarily feel there were not the numbers of applicants coming forward for roles (although not true in all). What was more of a concern was the quality of applicants and the ability to demonstrate their technical skills and competencies in digital and wider experiences. This skills shortage was reported as a mixture of technical and softer skills with candidates often lack one or the other and the difficulty in finding the "unicorn candidate" with both.

5.4 The skills system needs to be supported in creating a shared messages and language which provides a more in-depth narrative to explain areas of digital where there is complexity of progression routes, pathways, and roles. This should focus on real life examples of people in the industry and highlight specific technical skills, softer skills and mindsets as well as the formal qualifications.

5.5 This section offers an insight into the provision being offered at all levels and ages in GM. Due to the importance of COVID accelerating the transformation for digital skills and the impact on employment causing a surge in individuals looking to switch to a career in a more resilient sector this section will also look at the alternative provision available in GM as well as wider opportunities for adults to build digital skills.

Schools and Further Education (FE)

5.6 The fast pace of change in the industry makes it challenging for skills providers and assessors to keep up to date on the changing technology and industry trends, particularly where high levels of technical understanding are required. These have been long standing challenges in an industry were teaching salaries cannot hope to compete with those for practitioners with in-demand skills within the industry.

5.7 It is not just curriculum content being affected by COVID and increased online delivery has transformed so quickly that quality of practice and pedagogy as well as safeguarding IG etc has likely come second in just getting content out to learners. There is support for schools to support the growing demand for computing skills. The Department for Education (DfE) have invested significantly in improving the provision of computing education across England through The National Centre for Computing Education (NCCE). Run by a consortium made up of STEM Learning, the Raspberry Pi Foundation and BCS,

The Chartered Institute for IT, and offers various support to computer science teachers.

5.8 Figure 9 below shows 62% of GM schools offer Computer Science at a GSCE level, which looks like a good statistic, however, there is no data on entry numbers and if this is a selective qualification pathway, so this by no means that 62% of students in GM have access to this route.

5.9 Generally, in GM, the less deprived LAs offer more provision for their students to undertake GSCE CS, providing them with the pathways to continue with digital skills and benefit from digital employment opportunities and prospects such careers afford. The areas where the majority of schools (over 55%) offering Computer Science GCSE are Local Authorities that are within more socio-economically successful areas. (LAD 1 – 4 areas). Less Socio-economically successful areas (LAD 5 – 6 areas) schools offering the GCSE range from 55% to just 33% in Salford. The LAs that have more socio-economic challenges have less provision for their students, thus limiting their prospects for a digital career in the future.

5.10 However, 'At Risk' data shows it is a much more complicated picture. 'At Risk' is defined as schools that are struggling to maintain CS GCSE due to:

1 Lower than average attainment in the subject
2 Lower than average uptake in the subject
3 Change / loss of staff teaching CS GCSE
4 Ofsted or LA reviews have identified CS GCSE provision as a weakness.

Interestingly this follows a different trend to the offer of Computer Science GCSE and is very much bespoke to that LA such as Bury. However, where we have low provision of Computer Science GCSE and at-risk schools, such as the City of Salford, this paints an alarming picture. Especially considering the areas strength in terms of digital business stock. These at-risk areas need further investigating.

Local Authority	**2019-2020**		
	Offer GCSE	**Non-GCSE**	**At risk**
Bolton	79%	17%	4%
Bury	61%	22%	17%
Manchester	61%	36%	3%
Oldham	43%	52%	5%
Rochdale	50%	45%	5%
Salford	33%	59%	7%

Stockport	81%	19%	0%
Tameside	55%	45%	0%
Trafford	85%	15%	0%
Wigan	77%	23%	0%
National average	**62%**	**25%**	**4%**

Figure 8 Current GCSE data for GM schools offering Computer Science. Source, Get Information Schools Service, formerly Edubase, 2019/20

5.11 There are many different options for study for students aged 16 and above. Some move onto sixth form, others to further education colleges or private providers, including apprenticeships and wider technical education soon to include digital T-levels. This is an important part of the talent pipeline ensuring GM starts to build interest technical skills and real-life experiences with employers.

5.12 T levels are the Governments gold standard of technical education qualifications written by employers to help ensure that learners are given the skills they need to thrive in the Digital industry. T levels will be introduced in Digital Production Design and Development from September 2020 and in Digital Support Services and Digital Business Services from 2021. These allow employers to really become actively involved in the design and delivery of teaching the T Level content whilst also providing the opportunity for realistic and meaningful placements of up to 42 days for suitable learners. These placements become the talent pipeline for employers to shape and nurture their future workforce. A number of our FE colleges in GM will be at the forefront of offering digital T Levels:

- Digital support and services – Hopwood Hall, The Manchester College, Salford City College
- Digital Business Services – The Manchester College, Salford City College
- Digital Production Design and Development – Bolton College, Bury College, Hopwood Hall, The Manchester College, Oldham College, Salford City College, Trafford College Group, Oldham Sixth Form College, Access Creative College

Inspiration activity for young people

5.13 There is a wealth of activity to support young people to be inspired in developing digital skills. In preparing this report we were able to name over 50 different initiatives operating in GM. These initiatives offer a great way to

engage young people outside of the formal curriculum and in many cases reach parents at the same time. A shared set of quality criteria around this activity would be useful to ensure activity reaches audiences who could most benefit, is high quality and initiatives link you to provide young people transition routes to continue developing their digital skills and exploring what the industry has to offer.

Existing initiatives mentioned by stakeholders in producing this report, but by no means an exhaustive list of what is available in GM included:

- Code Club
- Coderdojo
- Go Digital
- Digital Her
- Manchester/Tameside/Oldham Hack
- Enterprise Advisor Network/Bridge GM
- STEM Learning – NCCE and STEM Ambassadors
- Git Hub
- Manchester Digital – Switch to Digital
- Cyber First
- Cyber Schools Club
- Library Coding Clubs
- Museum of Science and Industry
- Sharp project

5.14 A report from The Good Things Foundation using OfCom[10] has highlighted the extent of digital exclusion in Greater Manchester. This analysis looks at the extent and type of internet use which has raised some issues around groups of people who we may previously not considered to be digitally marginalised, for example young people who only have access to a smartphone, and whose use of the internet is confined to a very narrow range of activities which usually do not include accessing skills, employment or progression opportunities. In addition, the work of the GM Tech Fund and intelligence from local authorities has highlighted the issue of lack of access to devices, affordability of data packages. Those on low incomes are more likely to be digitally as well as socially excluded, limiting ability to access training and employment opportunities in the digital sector. This is likely to at least in part attribute to the lack of young people able to take up computer Science in some of the statistics above.

5.15 GM has a STEM Framework to support residents in building STEM capital to improve their life chances. Through this work GMCA have a concordat agreement with the Science and Industry Museum (SIM) to jointly deliver key objectives for employers, skills providers, and the community through their

[10] The Good Things Foundation, 2020

work. The framework approach and SIM as a key partner should help to offer a structured and collaborative approach to digital inspiration activity regionally.

Higher education

5.16 Graduate routes remain the main route into roles across the digital sector. Amongst respondents to Digital's Skills Audit 2020 29% reported entering the industry with a digital and tech related degree and another 22% reporting a degree but unrelated to digital and tech. Anecdotally many employers admit their main entry level routes still require a degree this seemed a mixture of the recruitment process demanding it and employers feeling the experience and skills of someone educated to that level gave them confidence in the calibre of individuals who would apply.

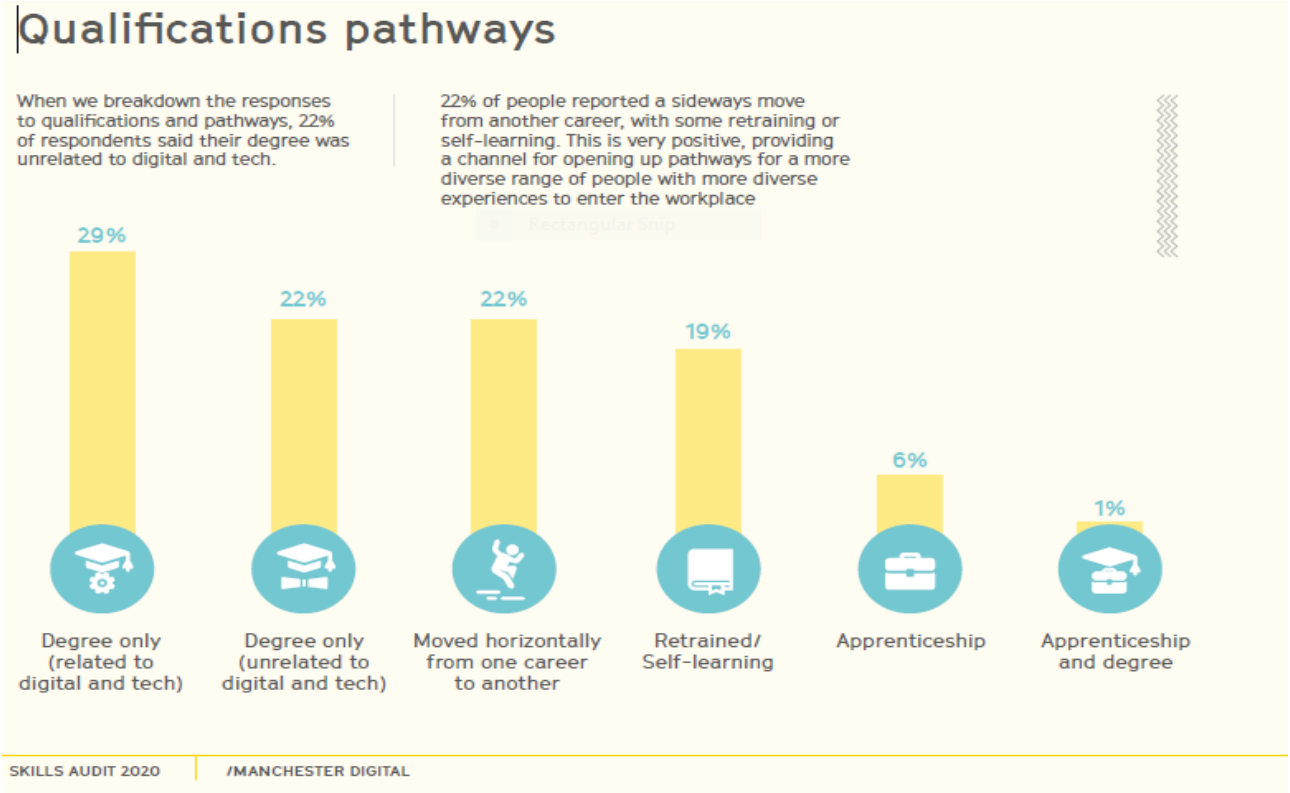


Figure 10 shows by far the biggest route into the digital industry is through a graduate degree both STEM and non-STEM based. Source, Manchester Digital Skills Audit, 2020

5.17 In GM there is considerable provision for both computing and wider STEM related courses. ESFA Datacube,2018/19 data shows there was a total of 4,385 students enrolled in computer science related courses (all full time and part-time undergraduate and postgraduate courses), with a wider 46,655 taking STEM subjects, which many employers report as adequate entry level qualification. A further 375 learners were involved in higher apprenticeship

starts (degree equivalent) in 2018/19. On top of this through our intelligence gathering Lancaster University reported a significant number of their graduates seeking employment in GM. What is clear is that the GM digital economy clearly has access to a wealth of digital talent.

5.18 What appears to be the problem is the employability of computer science graduates into the sector. Previous HESA research[11] has highlighted that computer science graduates are 5% more likely to be unemployed 6 months after graduation than other graduates. There are areas of good practice in supporting the employability of graduates, for example, MMU have a scheme called Third Term which supports graduates from wider disciplines to develop industry specific digital skills as a way of being employer ready.

5.19 GM is home to several centres of excellence at the forefront of producing graduate level talent. The School of Digital Arts (SODA) at MMU is a £35m investment in a ground-breaking interdisciplinary school to train the next generation of animators, games designers and UX professionals. UA92 have developed a brand-new digital upskill model in partnership with Microsoft providing people who may not have considered HE with the opportunity to gain a Cert HE in software development, develop their personal skills and undertake a work placement with an employer. Salford University have developed alternatives to traditional 3-year degree courses such as HNCs and HNDs to support employers immediate need for talent, and also suit young people who do not want a full 3 years at University before they can start earning. This approach will form the basis of a FE/HE/industry bid to DfE for an Institute of Technology.

[11] HESA, 2016

Case study – developing curricula in response to what employers need

University Academy 92 (UA92)

UA92 will be delivering their Digital Upskill Programme from 2021.

Intrinsic to the design of this 7-month programme is ensuring the learning aligns with what employers need but also designing training that provides opportunities for individuals who have been affected by COVID-19 and may be unemployed or looking to switch from a declining sector into digital.

UA92 started developing this innovative programme before the pandemic and had already identified Software Development as a key skills gap from both employers and wider organisations such as MIDAS. UA92 wanted to target groups who might not be able to engage with traditional University programmes. COVID-19 has only increased the need for a programme like this which can support and redeploy talent from declining sectors and offer holistic support which puts individuals in the best possible position for future employment in this growing sector.

The programme is 7 months long with learners achieving a Certificate of Higher Education in Software Development awarded by Lancaster University (Level 4 qualification equivalent to first year of the UA92 Computer Science degree). It is designed to support individuals who may have never coded before with recruitment based around recognising individuals with the right aptitude, values, work ethic and tenacity rather than existing technical skill.

The programme is truly employer led at every stage of development. UA92 have a strategic relationship with Microsoft including sharing campus space. Microsoft have been committed to developing talent to fill their own skills gap, but most importantly for the benefit of the sector regionally. Course content has been based on Microsoft's own research into the 10 different Software Developer pathways and they have been key in communicating the wider non-technical skills needed for employees to be able to succeed. These have then been embedded in UA92s offer.

The Digital Upskill Programme has an employer placement element and UA92 have worked hard to engage businesses of all types recognising that their learners need visualisation of different types of work settings to understand where they personally would most be happy in employment. In turn this supports talent development for SMEs and the public sector who are too often left competing for talent with bigger employers who can offer more.

The block delivery structure of the Digital Upskill programme will focus on coding and be delivered either 9am-1pm or 2-6pm for the duration of the programme, supporting

learners who may need to work or have other commitments. During the 7 months there will be a 12 hours per week of employer placement to ensure the course includes real life work experience. A key part of the offer is the character and personal development programme which allows learners to develop key aptitudes and mindsets which employers have advised are key for a career to progress successfully. Part of this is that each learner is allocated a personal development coach to ensure individuals can use their experiences in this part of the course to articulate where they have shown these important skills and therefore supporting the development of individual portfolios.

The holistic approach also includes a £2,000 grant for learners to support living expenses for those who are keen to commit to the seven-month programme who may not otherwise be able to take part. UA92 are keen to welcome candidates of all ages and backgrounds stressing the correct attitude and raw aptitude is most important.

Apprenticeships

5.20 Anecdotally we know apprenticeships are working well in GM for many areas of digital as employers appreciate the opportunity to shape and develop individuals with the specific technical and wider skills they need for their business. In conversations apprenticeships related to the areas of User Experience (MMU's Level 6-degree level apprenticeship was specifically pulled out as high quality), Digital marketing, Technical sales, and were very welcoming of the new DevOps Engineer apprenticeship standard at Level 4.

5.21 However, there was gaps with employers feeling there was a provision gap with junior graphic designers and the apprenticeship standard didn't quite meet their needs. Despite employers listing areas such as Network Engineer and DevOps Engineers as shortage areas there were no starts in these areas in GM (based on 2018/19 data) and various cyber apprenticeships had low numbers of learners. The reasons for these gaps could be due to any factors and will need further exploration with employers and skills providers.

5.22 GM can boast a strong provider base for digital apprenticeships with over 150 providers of all types delivering across all areas of the sector in the last 3 years.

5.23 Based on 2018/19 data there were 1009 starts across digital and this has been a static figure since 2016. Of these 89% were either advanced (58%) or higher (31%) level, likely reflecting the higher skill level of the industry. MMU were the AAC Digital Apprenticeships of the Year 2020and are often quoted as a model of good practice in this area.

5.24 Based on this data there are also positive indications for technical education addressing specific areas of digital where there are greatest skills need. For example, Data Analysts at Level 4 has increased learners from 2 in 2016/17 to 85 in 2018/19. Software Developer and Tester both at Level 4 have also increased significantly in this time.

Adults aged 19+

5.25 Digital skills, have, increasingly, been key a requirement for employability in the same way as English and maths. Further education not only provides the vocational skills needed by the local economy but also has a responsibility to support adults who may have missed out previously to gain the skills needed to function as a 'digital citizen', whether this is provide relevant life skills, progress into employment and/ or retrain as job roles change.

5.26 Based on GMs digital strengths and Manchester being the digital hub of GM, other LAs are keen to support their residents to take advantage of the opportunities this sector provides, and hence there is the need to ensure AEB learners can progress to relevant and higher-level qualifications for digital roles.

5.27 In 2018/19 there were a total of 8,360 Information and communication technology AEB enrolments in total. 43% of these were either entry level or Level1, likely indicating the need for digital skills for wider employability. Less than 2% of these were at level 3 with no one over the age of 25 undertaking and AEB at level 3 in this area.

5.28 There is the challenge for adult learners this year in being able to access not just suitable and relevant learning into employment, but a high volume of learning has moved online, and not all adults are either able to access online learning, due to the lack of suitable equipment or connectivity but also due to ability to move to online learning, which can be daunting for many adults. GMCA has looked to align AEB budget to support local solutions to this issue, set out in the case study below. This is at least in part the likely cause for the significant drop year on year in the take up of IT for user qualifications in figure 10 below. ICT for Practitioners was able to increase year or year, utilising the option to learn online.

	IT Users		**IT Practitioners**	
	18/19	*19/20*	*18/19*	*19/20*
Entry	822	572	107	11
Level 1	3037	2,019	75	283
Level 2	898	699	174	157
Level 3	0	0	141	142
Community Learning	3625	1,702	43	41
Total	8382	4992	540	634

Figure 9 Adult Education Figures from GMCA. Data shows enrolments for IT Users and IT practitioners at different levels.

Case study – AEB responding to digital barriers across GM

GMCA have committed £2m from Adult Education Budget and Local Growth Fund to support vulnerable adult residents across Greater Manchester to overcome various barriers, with £1m specifically dedicated to supporting residents to become digitally included.

The funds, split evenly across the ten Local Authority Areas, will support local residents to become digitally included with opportunities ranging from 1 on 1 support with getting online, help accessing relevant training to receiving the kit and connectivity they need via laptop loan schemes and connectivity packages. The funding will be given to Local Authorities directly to manage to ensure the support goes to residents who really need it.

This is part of the £2m Local Authority Grant Programme which will see Local Authorities propose projects and initiatives under 4 strands:

1 Digital inclusion

This strand will enable Local Authorities to promote the digital entitlement and wider skills offer to residents who cannot currently be targeted via traditional marketing means e.g., social media. The key outcome of this strand is to ensure that residents who are not digital savvy are not left behind, particularly those in the hardest to reach areas.

2 Digital kit and connectivity

This fund will enable Local Authorities to purchase Kit and Connectivity equipment to support their residents. It's a preference that this is directly linked to their Digital Inclusion activity, but not essential.

3 ESOL

4 Alleviating Barriers to Adult Education

Examples of approved proposals include:

1. MESH connectivity network in Rochdale which will provide instant Wi-Fi connectivity to up to 3000 residents
2. Digital help and loan service in Bolton to provide residents with the access to Kit and the initial skills to be able to use
3. Classroom in a Box project in Oldham to loan Kit to local community organisations who are engaged with and supporting residents in the hardest to reach areas

4. A Digital Inclusion co-ordinator post in Tameside to engage with residents and adult education providers to develop and promote an effective working model to support residents getting digital
5. A digital volunteer service in Trafford to work with local residents and support them with their digital needs by training them on a 1-1 basis

"With the coronavirus pandemic our colleges and training providers within Greater Manchester have made great steps in delivering services remotely while still providing training and skills support to learners.

The pandemic has highlighted the need for greater support for our digitally excluded residents, and I'm pleased to see our city-region respond in this way to ensure no resident is left behind."

Councillor Sean Fielding
GMCA Lead for Employment, Skills and Digital

Alternative provision

5.29 There is likely to be a rise in the number of career switchers and people looking to reskill/upskill into digital. We are already seeing this with the Switch to digital week which saw over 600 registrations. Feedback from participants showed that there is a gap in provision to support those looking for a career in digital.

5.30 During talking to employers, it has become clear that the traditional education sector is only one part of the story in developing digital talent. GM has a thriving informal learning sector with ed-tech companies like Hive Learning, Digital Advantage, Innovate Her & Code4Girls collaborating to provide accessible opportunities for diverse groups. This is supplemented by a whole host of tech community meetups e.g., Code and Stuff, Her Plus Data Manchester that aim to inspire, connect, and empower people working in the industry. Bootcamps. And there are a whole range of high quality of coding bootcamps that provide an alternative pathway for people from under-represented groups to enter the industry often achieving employment outcomes of over 95%. Northcoders, Code Nation, Manchester Codes & Tech Returners are amongst the best known.

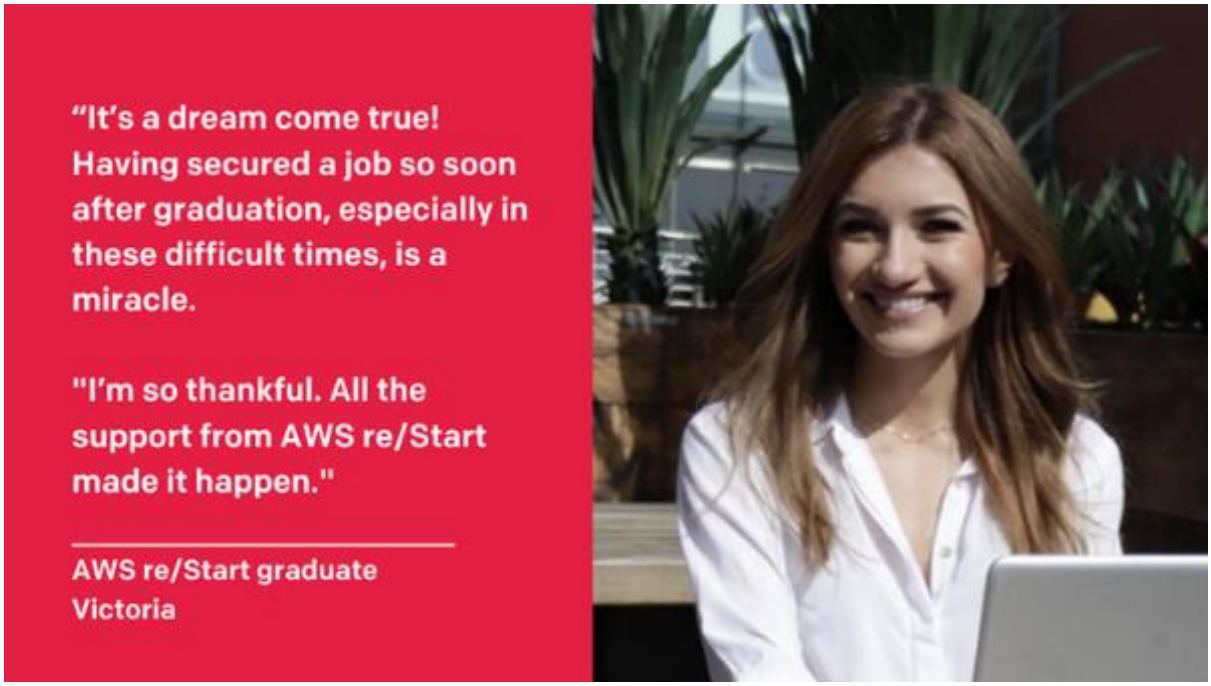
5.31 The Fast Track Digital Workforce Fund has started to accelerate alternative pathways into the industry. It is a £3m partnership between GMCA, DCMS & the Lancashire Digital Skills Partnership, which aims to support employers to recruit hard to fill vacancies requiring specialist digital skills & diversify their workforce through bespoke co-designed provision. Thus far the Fast Track Fund has supported 20 projects across a wide range of digital skill areas from digital marketing and content creation through to software development and data analysis. A wide range of employers have been engaged of all sizes and across all sectors. We have recently been awarded a further £1.5m by the Department for Education (DfE) to extend the pilot; by April 2021, 1,200 people will have been supported to enter the digital industry through the Fast Track Fund.

Case Study – Generation AWS re/Start

Generation received funding in round 1 of the Fast Track Digital Workforce Fund to deliver their AWS re/Start training programme. The AWS re/Start programme is a 12 week, full-time, boot camp run in collaboration with the Princes Trust, which prepares individuals for entry-level cloud positions. The program was designed to support unemployed and underemployed individuals by providing education in AWS Cloud skills and connecting alumni with potential employers.

Victoria moved from Russia to the UK in 2017 at the age of 26. She struggled to find a job, despite her degree in economics. After doing some casual work in a call centre, whilst studying web design in the evenings, she came across an advert for the AWS re/Start bootcamp. Due to her interest in Technology, it sounded like the perfect match and she was delighted to be given the chance to study alongside other AWS hopefuls. 3 months later and after successful graduating from the course Victoria was lined up with an interview at Oxbury Bank Plc. She was delighted to be offered the role as Trainee AWS Engineer.

"We're really excited to have Victoria join the Oxbury IT Operations team. The skills she has acquired on the AWS re/Start programme will definitely stand her in good stead and we look forwards to helping her to achieve her potential in a fast-moving and dynamic industry." Stuart Ellidge, CTO at Oxbury



5.32 GMCA have learnt the following lessons about delivering quality digital bootcamps, key quality criteria include:

- Develop an employer-led approach: Employer-led projects, masterclasses, industry accreditations & mentoring delivered the skills employers said they needed.
- Focus on place: By working with local employers and providers we were able to curate a cohesive offering and respond to gaps. Bootcamps can only be successful if driven locally and as one element of a cohesive adult skills strategy.
- Work with diverse providers: Different organisations have allowed us to reach groups under-represented in digital roles. Those who place employer engagement as their core mission have delivered by far the best outcomes for individuals & businesses.
- High impact pedagogy: Targeted behavioural skills and mindsets for the specific role. Practice based curriculum to actively engage participants.

6. Recommendations section – addressing the gaps, next steps and future reports

6.1 This section of the report pulls together learning from the intelligence gathering process to inform key recommendations for the industry. At this stage this is high level and GMCA will produce a further detailed action plan early in the New Year 2012.

6.2 Recommendations made here will not all be taken forward or led by future work at GMCA. Recommendations are aimed at supporting all stakeholders including employers, business networks and membership organisations, skills providers of all types and organisations which support digital skills development the understanding of the current skills situation to support with shaping future talent and skills development.

Summary of findings

Digital occupations – Deciding on a career

Challenges

6.3 Based on employer evidence gathered for this report the main challenges to individuals being inspired to enter the digital industry and seeking training are:

- For many areas of digital e.g., cyber there are unclear progression pathways and unclear roles and role titles making it difficult to understand the best routes into the industry and understand what qualifications employers are looking for.
- Due to a lack of understanding of what employers need it can be challenging in finding people with the right competencies, mindsets and softer skills and attributes. Individuals then struggle with what they need to articulate to an employer.
- Lack of understanding about the industry and negative stereotypes and image of the sector leads to misunderstanding around the type of person the industry is looking for. This puts many off and older people especially feel there is not the opportunities for them.
- GM boasts a wealth of initiatives to inspire young people into the industry and lots of organisations wanting to work with schools. Lack of shared messaging, and silo working means they are not having as much of an impact as they might have.
- Lack of access to digital for some residents means that there are still groups who are digitally excluded and are not able to take advantage of opportunities.

Recommendations

6.4 Based on evidence gathered for the report the following recommendations would help to support gaps for individuals seeking training for a digital career:

- Need to support our residents to be able to navigate occupational pathways for digital, especially in areas where it is harder to explain different jobs and routes in and through the industry for example

cyber. To do this those careers staff and work coaches advising residents on digital careers need to have shared messages and narratives around different areas of digital and use real life stories to bring progression routes to life and explain not just technical skills and qualifications, but also mindsets and softer skills employers are looking for. Industry will need to help with this as careers advisors and work coaches cannot be experts on every sector.

- Support is needed for the wealth of inspiration initiatives in GM to be able to collaborate around the following areas:
    - Cross -promotion and signposting which support transition between initiatives.
    - Targeted support at those who could most benefit and may otherwise miss out.
    - Develop high quality delivery practices which inspire and promote inclusion, rather than deter different groups from engaging further with digital.
- Portfolio development – all initiatives, however early in an individual's career journey should support the development of that individual's digital portfolio where they can demonstrate the technical skills and wider competencies, they have developed through being involved.

Digital occupations – accessing effective training

Challenges

6.5 Based on employer evidence gathered for this report the main challenges to individuals accessing effective training are:

- Lack of understanding about the different types of training available which employers most value. This is a challenge for new entrants and those wanting to switch into digital roles as well as for careers advisors and work coaches.
- Potential learners can be unaware of the wider softer skills and mindsets needed alongside technical competencies to be

successful within the industry. Training provision needs to better assess for these basic aptitudes and competencies for softer skills alongside technical competency in the design of recruitment.

- Good practice does exist for alternative entry into digital roles, but they are needed at a bigger scale including technical routes and bootcamp style training where appropriate.
- Fast moving development of technology and the proceeding fast development of new job roles including hybrid roles is making it challenging for skills providers to respond, for example Cloud Engineering.
- Cost of upskilling can be a barrier for individuals. Particularly beyond Level 3 where most of the skills provision requires a loan or self/employer funding.
- Employers feel graduates do not have enough practical experience of the industry. This has been attributed to the lack of employer ready skills.

Recommendations

6.6 Based on evidence gathered for the report the following recommendations would help to support gaps for individuals seeking effective training:

- Learners need to be better supported to seek exiting training and recognise high quality aspects of the training including links with employers, support to develop their digital portfolio and appropriate assessment and development of soft skills throughout training.
- These quality aspects should be “built in” into skills commissioning at GMCA and translated to skills providers in GM to increase the quality of their offer.
- Increase technical routes into the sector including developing more flexible routes which better suit needs of different groups of learners who may be looking to switch careers, including wrap around holistic support for learners to remove barriers.
- Universities need to maximise employer links to guide the development of digital courses so that they better reflect real life working and include live employer briefs as well as mentoring to support employer readiness of graduates.

Digital Occupations – Seeking employment

Challenges

6.7 Based on employer evidence gathered for this report the main challenges to individuals seeking employment in the digital industry are:

- Recruitment processes often focus on qualifications rather than aptitude which leads to the majority of recruits being graduates and employers missing out on great talent.
- There are some good practice examples of recruitment based more on mindsets and softer skills, but this practice is not widespread within the sector and causes a barrier for some individuals who may otherwise thrive given the opportunity.
- Employers feel candidates are often unable to articulate examples of where they have demonstrated their technical and non-technical skills through real life examples.
- For some sectors the length of the recruitment process is causing barriers, for example length of time to get security clearance in areas such as cyber and finance.
- Due to lack of talent, recruitment fees can be costly and preventative for some employers including SMEs and public sector. In turn higher salaries can pull people away from these sectors to larger employers and can make it difficult for education and training provides to attract appropriately skilled/experienced individuals to deliver training and assessment.
- Some short course bootcamp style training has been criticised for creating a misunderstanding between employers and learners around the level of role available to them when moving into employment. Candidates have in cases been left with an inflated expectation around role and salary level.

Recommendations

6.8 Based on evidence gathered for the report the following recommendations would help to support gaps for individuals seeking employment in digital roles:

- Need to support existing IT teams to develop more specific high - level digital skills in areas such as cyber, data analysis and cloud.
- The digital industry needs support inclusive recruitment practices building on GM good practice. Adopting an agreed approach could make a significant impact to the diversity of workforces.
- All skills activity related to digital (formal and informal) should support individuals to develop a digital portfolio where they are able to demonstrate and articulate real-life examples of where they have used their technical and non-technical skills needed by the industry.
- Individuals looking to enter the digital industry need more opportunity for mentoring and coaching by industry experts who can support them to navigate the complex digital business landscape and be best prepared for employment.
- Opportunity to support individuals looking for opportunities in the digital industry to link with industry experts in navigating the industry and seeking employment through activity such as mentoring.

Digital occupations – remaining in employment and progression

Challenges

6.9 Based on employer evidence gathered for this report the main challenges to individuals remaining in digital employment and progressing are:

- Some areas of the digital industry report highly stressful environments especially at more specialised senior roles where there are unfavourable working practices for example, long hours and long stays away from home. This can lead to loss of talent, prevention of talent progressing and lack of diversity at senior roles.
- Complex nature of the digital industry makes it challenging for individuals to understand how to best progress and make use of the transferability of their digital and softer skills.
- Digital transformation and restructuring due to COVID puts some at risk of redundancy which could be prevented with upskilling.

Recommendations

6.10 Based on evidence gathered for the report the following recommendations would help to support gaps for individuals seeking to progress in employment in digital roles:

- The digital industry needs support to work together and recognise good quality inclusive workplace practices. Adopting an agreed approach could make a significant impact to the diversity of workforces. This should be linked to the above recommendation on inclusive recruitment practices.
- Innovative models such as Digital Interruptions DecSecOps model should be explored to support change in culture, to save money in businesses and support in developing talent pipelines for highly skilled specialised roles.
- In house support mechanisms such as coaching and mentoring should be put in place to support transitions of individuals from training to employment and in work progression. This could be linked to training alumni activity.
- Individuals need to be upskilled due to digital transformation to support productivity of all sectors, redeploy skills, and prevent redundancies.

Next steps

6.11 The recommendations above are high level and GMCA needs to develop these into an action plan. This will identify internal mechanisms, programmes, and funding where we can respond as well as identifying other stakeholders who can respond to this intelligence individually or in collaboration through wider networks. This action plan will be published in early 2021.

Future reports

6.12 There is ongoing intelligence gathering to identify skills and talent needs of the digital sector and understand gaps in progression routes. There are areas of the sector which need further, and deeper exploration and it is expected a revised version of this report will be published towards the end of 2021 reflecting these further findings.

6.13 Areas already identified where further skills intelligence gathering is needed as a priority include:

- The wider creative industry was not a focus for this report and is a key industry strength for the region. A future report would look to build on the industry skills intelligence collected by SODA in this report and understand skills implications related to COVID on the high level of digital freelancers.
- In-work progression was not a key focus of the report and more work needs to be done to understand good practice related to supporting individuals to progress within and across the digital industry in GM.
- Although this report has identified 10 occupational clusters based on employers' understanding of GM's digital industry, more work will need to be done to further understand the technical skills, softer skills and mindsets required at entry level and progressive levels within each area.
- Future intelligence gathering will look at the need for skills created by digital transformation across the public sector. There are some good practice examples in Stockport and areas of the public sector are reporting specific needs, for example FinTech and cyber needs in the police and data skills within the NHS.
- The team have already prioritised intelligence gathering for talent needs related to FinTech in GM's wider professional and financial services industry. This is a vast area, and we need to better understand where there are areas of priority skills needs and where there are gaps in provision.