ACCELERATING ADOPTION OF DIGITAL TECHNOLOGIES IN GREATER MANCHESTER

Item No.4

INTRODUCTION

1.1 The Greater Manchester LEP has established a Task and Finish Group (TFG) to identify ways that the City-Region can better support local businesses to accelerate the adoption of digital technologies in order to maximise their growth and productivity, and be fully competitive in the developing global economy. The Group has been chaired by David Birch, and membership includes Mark Hughes (The Growth Company), Leanne Holmes (Cranes Payment Innovation), John Falder (HMG Paints), Adrienne Tonge (Synectic Electronics), and Carole Pearson (Marks and Spencer). Additional input has been received from the Federation of Small Businesses (FSB), as well as through engagement with the West Yorkshire Combined Authority and the Liverpool City Region LEP. Contributions to the final report have also been made by a number of GM LEP members. Support on writing the report has been provided by Michael Contaldo (GMCA).

1.2 The aim of this TFG has been to develop a better understanding of the scale of the opportunity for the GM economy from adopting, diffusing and embedding digital technologies; as well as the level of awareness and preparedness across the business base of the opportunity. As part of this, it has aimed to get a more precise understanding about the perceived and actual barriers to adopting digital technologies, and to recommend a series of actions in response to accelerate the change.

1.3 The work of the TFG will particularly help to support the delivery of at least two priorities within the recently refreshed Greater Manchester Strategy. More specifically it will support the GMCA ambition for GM to be a “World Leading Digital City Region” by informing development of the GM Digital Strategy:

- Priority 3: Good jobs, with opportunities for people to progress and develop; and
- Priority 4: A thriving and productive economy in all parts of GM.

1.4 This report is not based on new primary research, but is rather a distillation of a number of recent surveys and reports, with as far as possible a GM perspective overlaid. It has subsequently been tested with local business leaders and partners to help determine where action should be focused going forward.

1.5 The adoption and diffusion of digital technologies across the business base creates a major opportunity for growth and a catalyst for innovation in a rapidly evolving global economy, providing scope for companies to operate more effectively and to potentially grow their share of the market. It is therefore essential that key partners across GM put in place the correct eco-system that allows those “pioneer” firms in GM to set the pace to become strong and competitive enterprises; while also providing the right support to the “late adopters” who must deal with both internal and external barriers if they are to maximise the benefits of these strengthening economic trends. As a minimum, a culture of active leadership is required to accelerate the take-up of new digital-based technologies, alongside effective strategies and mechanisms to ensure the diffusion of that knowledge across all parts of the business.
1.6 This issue goes well beyond traditional e-commerce and digital marketing (for example the setting-up of websites), and is more than simply enhancing software and IT capabilities across businesses in GM. Instead, it is the fundamental disruption and reinvention of existing business models and the creation of new revenue streams through business and technical innovation, and therefore requires a long term approach (often with sustained capital investment).

1.7 The figure below shows a number of current digital technologies that are gaining resonance. For example, the Internet of Things (IoT), Artificial Intelligence (AI), Robotics, Data Analytics, Additive Printing, Cognitive Computing, Augmented Reality, Virtual Reality, Block-chain, and Drone Technology. However, these technologies should not be seen as static: they continue to evolve. It is not the particular technology that matters, but rather that businesses have organisational cultures and strategies that mean they are open to using digital technology to make their business more efficient and to respond to changing customer demand.

*Figure: Mapping the enablers for digital technologies*¹

1.8 - We are doing more than is generally understood

1.9 Our research has found that there is already much that is being done at the GM level on this agenda. GM already offers support to businesses that want to embrace digital. The Business Growth Hub operates a programme designed to accelerate adoption of digital technologies via a team of Digital Advisors working on a 1-2-1 and group basis with SMEs across all sectors. The Digital Advisors offer support to businesses in the adoption of digital marketing techniques and the development of more robust and appropriate digital infrastructure. The programme also delivers an extensive range of workshops and masterclasses throughout the year with topics including digital transformation, digital marketing, email and content marketing, as well as infrastructure based sessions including cloud and cybersecurity. SMEs are also able to access networking events, in partnership with The Landing, UK Fast and Creative England.

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<th>What’s possible: Examples of transformative digital adoption in GM</th>
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<td><strong>Binary Box</strong> specialises in creating unique pieces of removable wall art. While the business had a website, internally there was a lack of the necessary skills to fully maximise the benefits of online marketing. The Business Growth Hub digital team provided up-skilling support in digital marketing techniques, training the Binary Box team specifically in SEO (search engine optimisation) to support data analysis, usability testing and ongoing optimisation, plus PPC (pay per click advertising) to support the delivery of a new online campaign. SEO was also used to analyse competitor online behaviour highlighting the need for high domain authority back links and a SEM Rush SEO software to monitor and grow organic keyword ranking. As a result of the work completed Binary Box had a 20% increase in website traffic over a 4 month period; 15% increase in online sales in the same period; gained 2 large accounts; secured a £50k loan for expansion plans on the back of the business growth; and employed 2 new staff members in design and production.</td>
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1.10 However, GM needs to think about how it reaches even more of the local business base to build on the work already underway. Thinking carefully about the branding and promotion of these ambitions, with all GM partners getting collectively behind a plan of work. The issue is not confined to any one sector, but instead needs to be considered across the whole of the GM economy. Most focus has tended to be in the area of manufacturing where the trend is commonly understood as Industrial Digitalisation or Industry 4.0 – a term for the use of automation and data exchange in manufacturing technologies, including cyber-physical systems, IoT and cloud computing. This interaction and merging boundaries between physical and virtual in production is also known as the ‘Fourth Industrial Revolution’. However, the same issue has resonance for all parts of the economy – not just manufacturing, but industry more widely, as well as the services sector, and of course the public sector (including the important area of health). Systems, processes, machines and people everywhere are increasingly required to communicate with each other, exchange and analyse data and make decisions in real-time.

1.11 Critically therefore, it is key that the adoption of digital technologies is not seen as a generic issue that can cut equally across all businesses and all sectors. If the GM is to make genuine progress in this area, it must show that it is recognised that there are specific sector perspectives and associated actions - for example the needs of retail will be different from healthcare, and they are likely in many case to be using different technologies. It is beyond the scope of this T&F Group to do this properly, but instead it will need to be addressed as part of the way forward on the wider GM Digital Strategy.
1.12 For example Sir John Bell in his review of Life Sciences spoke about the enormous gains in health outcomes and life expectancy achieved over the last 30 years, which going forward will depend on both existing innovation platforms for drug and device discovery, and also a host of new scientific platforms for improving health. These will include digital tools, robotics, artificial intelligence based on machine learning and totally new therapeutic approaches to disease such as gene therapy, nucleic acid based therapies or cell therapy; as well as transitioning away from paper-based records by those parts of the health service that are patient-facing. Data in the healthcare system provides crucial opportunities to fundamentally change the way health services are provided and developing digital tools, such as AI, is going to form an increasingly important segment of the life sciences sector.2

1.13 However, the challenge to GM remains that it is still only a minority of businesses that are actively taking full advantage of these technological developments, and we risk creating a ‘digital divide’ between those businesses that are at the frontier digital transformation and keeping the City-Region ahead in terms of global ecommerce and technology, and those businesses who have further to go before they can call themselves a business that have fully embraced the potential of digital technologies.

1.14 It is important as part of this that there is therefore an awareness of the different challenges and opportunities that will impact upon different sectors and sub-sectors of the economy (both the private and the public) – digital technology will transform all operating models but the effect and pace will be different in each. Likewise, it is critical to recognize that the smaller businesses are likely to require support to address the issue of adoption; whereas it is about diffusion of digital technologies within bigger organizations that is likely to be the key challenge. There is an opportunity within GM to reflect the realities of different economic sectors as partners with national government to develop a Local Industrial Strategy over the coming year. Finally, a nuanced approach needs to recognize that different technologies will be required and applied even within one organisation (eg different needs and issues for sales, marketing, distribution etc).

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2. OPPORTUNITY TO BE SEIZED

2.1 The wholesale adoption of digital technologies has the potential to be hugely disruptive both for the UK but also for the GM economy, having a profound and potentially unprecedented impact on production techniques, supply chains, business models, workforce and global networks. Digital technology has catalysed the interconnection of the global economy, with the internet enabling the free exchange of goods and services, providing consumers with greater choice and businesses with access to skills, resources and customers. As a result, people are now accessing more digital content and services from outside their own country, cross-border payments are increasing, and small companies are more easily becoming more “multinational”. A global survey and index on connectedness published by McKinsey found that 86% of tech-based start-ups globally reported cross-border activity, and that 360 million people had participated in cross-border e-commerce.

2.2 Businesses in GM therefore need to be ready to capitalise on this and ensure they do not miss out by being unprepared. Existing firms cannot afford to overlook such fundamental shifts in the market, or to respond to new competitors by failing to innovate and embrace new technologies that are on offer. In particular, they need to be aware of the changing demands of customers where behaviours increasingly look toward more personalised and higher value services. In contrast, for start-up businesses in GM there is an unprecedented opportunity to get a foot-hold in a dynamic market provided they are able to respond to customer needs around greater choice and convenience, and are prepared to make the right internal investments. For example, in 2017 many retailers in the UK reported that most Christmas sales now occurred online, rather than in-store (recognising an increasing personalisation of goods/services).

2.3 By 2025 the economy is likely to be already highly digitised, using vast amounts of data, and interacting with AI, the Internet of Things, new social media, and smart devices. Sophisticated analytics on this data will enable powerful personalisation, allowing firms to deliver highly targeted products and services. The way in which firms deliver services will also be transformed. There will be far greater fluidity and flexibility between ways of working, with a skills shift to data, digital and cyber, alongside more agile career models and working styles. Fewer people will perform manual, repetitive jobs due to robotics and automation, as standard decisions will be made using algorithms, AI and machine learning. The competitive landscape will be characterised by significantly more innovation, driving fierce competition from unexpected sources.

2.4 The Digital Catapult has estimated that if the full potential of digital technology could be realised across the UK, then it could add £10.5bn per year to total output between 2017 and 2020 (equivalent to about GVA growth of about 1% a year on a baseline of £1,651bn). For GM this could be worth an additional £600m a year (or £1.2bn by 2020) above business as normal on a baseline £60bn.

2.5 Every company will need to take the journey eventually and those that start sooner will reap the benefits more quickly - firms that do not embrace the opportunity from digital technologies run the risk of getting left behind, becoming increasingly uncompetitive and ultimately going under. The Made Smarter review has suggested that it could increase growth just in the manufacturing sector nationally by between 1.5 and 3 percent per annum. Generating a net gain of 175,000 jobs throughout the economy, a reduction in carbon emissions of 4.5 percent, and improving industrial productivity by

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more than 25 percent. Likewise, the review estimated that digital technologies have the potential to add US$14.2 trillion to the world economy as a whole over the next 15 years, and has highlighted the opportunities from a number of particular technologies:

- Internet of Things (worth $7.3 trillion by 2017);
- Wearable technologies (worth $70 billion by 2024);
- Advanced manufacturing, building automation (worth $49 billion by 2018);
- Big Data and data analytics (worth $32 billion by 2017);
- Robotics (worth $29 billion by 2018);
- Autonomous vehicles (worth $28 billion by 2020); and
- 5G and associated wireless technologies (expecting a 40-fold increase by 2018)

2.6 Results from the 2017 Greater Manchester Business Survey shows that only 15% of businesses locally had accessed business support services over the previous 12 months. However, of these more than a third (34%) had done so specifically to get advice on digital services and technologies; and 30% of firms plan to seek such advice again over the coming year. Interestingly the figure rises for those businesses that are “export-active” – with 21% seeking business support, and 40% of those wanting advice on digital technologies. This reflects the fact that 12% of GM companies see the adoption of digital technologies as a key barrier to the growth of their business.

2.7 Adoption of digital technologies therefore has the potential to create a step-change in innovation and productivity not only in GM’s manufacturing base but crucially across all sectors of the economy, and to alter the balance between goods and services, boost skill levels and wages, and change the nature of international networks and trading relationships. However, it also raises challenges in terms of certain skill-sets, jobs becoming obsolete and challenges around information security which need to be considered and addressed.

Improved customer service

2.8 The increase of automation will have major impacts on the size and composition of the workforce. It may drive job losses, but it will also create new, higher-value jobs and opportunities. A PwC study suggested that full adoption of AI may remove up to 30% of jobs in the UK over coming decades, with many manually intensive and repetitive tasks fully automated in the future. Other activities will see robots enhance but not replace the work of people – enabling the economy to keep doing what it is doing today, only better or faster. However, certain activities will remain ‘robot exempt’ – such as creativity, judgements on ethics, and communication. These changes will drive a rebalancing of the skills required, and GM partners need to be mindful of these when designing any long-term strategy for skills.

2.9 Through better use of digital technologies, customers will be able to tailor their experience and effortlessly integrate services from multiple providers. Information will be available in real time, independent of location, and decisions will be made near-instantaneously. The majority of businesses

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5 Juergen Maier, “Made Smarter. Review”, December 2017
6 GMCA, “GM Business Survey 2017”
7 PWC, “A vision for a transformed world-leading industry: UK-based financial and related professional services”, 2017
do already recognise the important impact on the improved customer experience that technology can help to deliver. However, many still need to develop the key capabilities to build customer-centric businesses, using better insight, and the better management of customer and stakeholder data.

*Figure: Business investment in technology*[^8]

Internal efficiencies

2.10 The adoption of digital technology is also good for a business’s operating costs. The evidence points to the fact that small businesses with high digital capability are already 3 times more likely to save time, 5 times more likely to save costs, 11 times more likely to trade overseas than the least digital[^9]. Benefits from digital technologies are likely to continue to be better quality products (ability to track products in case of defects), less waste, more efficient energy use, predictive maintenance and service, a safer working environment, quicker time to market, and a solution to reduce constraints around capacity.

2.11 Increased take-up of digital technology also allows businesses to collaborate more dynamically amongst themselves, in a way that is invisible to consumers and end-users. By taking a pro-active approach in investing in digital technologies it will also ensure growth from GM firms in their export competitiveness and potentially capture a larger share of global market relative to other centres. Additionally, new digital technologies (AI in particular) have the potential to effectively liberate or democratise knowledge within a business, offering an opportunity for wider decision-making and challenging existing practices; and thus stimulating innovation and creativity.

BUILDING ON GM’S DIGITAL TECHNOLOGY ASSETS

2.12 GM is already well placed to push the adoption of digital technologies based on a number of important local strengths and assets:

[^9]: Lloyds Bank, “*UK Business Digital Index 2017*”. 
The creative and digital sector in GM currently accounts for 82,300 jobs and generates GVA of £4.1bn per annum. There are over 10,000 digital and creative businesses, and nearly 1,600 tech start-ups formed locally in 2017. Additionally, there are 15,000 creative, digital and IT students at GM’s four HEIs. Digital was identified as one of GM’s fast growth opportunities in the 2016 Science and Innovation Audit.

MediaCityUK, a nationally significant digital industry cluster is home to the BBC and ITV and 250 digital companies providing 7,000 digital jobs. It continues to expand – the BBC recently advertised 200 digital specialist jobs. Additionally the University of Salford provides over 30 courses there for 1,700 students; while the UTC and Oasis Academy are training young people in the digital technologies of the future.

The Sharp Project in East Manchester is growing new creative and digital business in its incubator spaces. The Northern Quarter in Manchester City Centre is seeding successful disruptive businesses; Spinningfields is attracting tech hubs wanting to be close to the city’s finance and professional service centres (fin-tech).

The School of Computer Science at the University of Manchester has major strengths in Big Data, Artificial Intelligence and novel computer architectures; UoM’s Data Science Institute brings together over 250 researchers in Big Data from across the University; UoM is a lead partner in the N8 High Performance Computing Centre across the wider North of England.

GM has a growing strength and significant opportunity in the field of cyber security, including a new Centre of Excellence.

£10m has been given to host City Verve’s IoT Demonstrator.

The Hartree Centre at Daresbury is one of the world’s most powerful supercomputing and data analysis infrastructures, with over £350m from government and IBM to support research into the next generation of data-intensive systems.

Corridor Manchester hosts the European Big Data Laboratory, the European HQ of Hitachi’s Global Centre for Innovative Analytics, with strong links to the US, as well as the Cisco CREATE UK R&D team.

MMU were one of the first places in the UK to offer Tech Partnership Gold accredited Digital & Technology Solutions Degree Apprenticeship and are now one of the largest providers in this space - with 4 different specialist pathways (Software Engineer, IT Consultant, Data Analyst, and Cyber Security). 600 Degree Apprentices are currently enrolled.

The University of Salford has been the site of the UK’s National Advanced Robotics Research Centre since 1987, and offers MSc in Robotics and Automation, Robotics and Artificial Intelligence and PgDip in Robotics and Automation.

Universities of Manchester and Salford, and RU Robots, one of the UK’s foremost Advanced Robotics and Cognitive Science Company were two of the founders of the Northern Robotics Network, which works across the North to identify ways in which world class research, cutting edge companies and innovative application, can help drive the future of robotics in the UK. NRN have already identified a strong cluster of activity around robotics in hazardous environments related to the nuclear industry (where GM also has particular academic strengths).

The Siemens factory in Didsbury focuses on industry automation and drive technologies. A number of organisations also provide specialist support including Manchester digital, Design Manchester, Tech North, and Madlab.
Manchester Metropolitan University, the University of Manchester and other university partners will be leading a new £40million National Institute of Coding. This will bring together universities, large corporations, SMEs and industry groups to tackle the shortfall in the digital sector – the digital skills gap. Funding will develop new undergraduate and postgraduate courses, attract new staffing talent to the University, encourage more women into the sector, address challenges experienced by mature students and students from ethnic minorities, create new pathways to transfer knowledge to industry and inspire a new generation of tech leaders through community outreach.

3. BARRIERS TO ADOPTION

3.1 Keeping up with the pace and scale of technological change can be a daunting task for many businesses, particularly as these changing at an unprecedented rate, and in itself presents a barrier to full engagement. Undoubtedly there are a number of “pioneer” firms across GM in terms of the adoption of digital technologies - having understood the potential and made the appropriate internal organizational and capital investments. However, there are still many firms in all sectors that still regard themselves simply as “followers” - those businesses that wait for a technology to become mainstream before thinking about adoption. In between are those that see merit in technology and are keen to experiment with it, but only after the relative advantages of doing so have been established by leaders.

3.2 Research by the CBI suggests that the “digitalisation” agenda is a high priority for a sizable percentage (around 40%) of firms across all sectors in the North of England, but this is still a minority of the total. The evidence also points to the majority of businesses still failing to use around 80% of customer data generated in order to better tailor their goods and services to meet the demands of the market. National research suggests that awareness levels of the potential of digital technologies are improving, but confusion remains about what it all means, and therefore levels of preparedness remain too low.

3.3 It is also worth noting that many of the barriers are shared by different sectors of the economy (retail, health, manufacturing, public sector, financial services etc.) In the case of manufacturing, for example, while GM may have a world-leader in “industrial digitalisation or “Industry 4.0” at the heart of the City-Region (Siemens), it remains the case that the majority of GM’s manufacturing companies are small, with an ageing workforce, and often lack the knowledge, funding and ambition required to take advantage of new digital technologies in the same way as the bigger players. A step-change is therefore clearly required across the GM business base which has a disproportionate number of SMEs within it compared to other parts of the country such as London and the South-East. Some of the actions that need to be taken are generic and will have an effect on all parts of the economy (the private sector as well as the public sector). However, this report notes that it is important in some cases to move beyond the generic and understand that there will be certain technologies or challenges that will matter more to certain sectors (and even within individual parts of a business) – therefore we need programmes and initiatives in place that respond to these nuances (rather than a catch-all).

Skills

3.4 A report by Accenture and Oxford Economics suggests that high-performing economies could realise better returns from investments in digital technologies, but that there remains a failure at the policy level to respond to these.

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level to prepare the workforce of the future\textsuperscript{11}. Therefore accelerating the adoption of digital technologies needs to go alongside wider efforts to improve digital skills. However, this is not just about investing in digital skills across the general population. But also about being able to attract world-leading domestic and international entrepreneurial, digital and financial talent to the GM eco-system.

3.5 The Government’s UK Digital Strategy 2017 outlines that there will be a digital skills gap of 1.2m jobs in the UK by 2022 if there is no intervention.\textsuperscript{12} 41\% of small businesses on average in the UK do not have the full set of Basic Digital Skills (defined as Managing Information, Communicating, Transacting, Problem-Solving, Creating). A report by Lloyds suggest that that a third of the least digital small firms nationally are concerned that a lack of digital or online skills by staff is a significant barrier to the adoption of digital technologies.\textsuperscript{13}

3.6 The issue remains that many GM firms still do not have the skills they need within their workforce to use digital technologies effectively. It remains hard to find and recruit people with the digital skills that are needed (from marketing to operations). There is also a need to transfer experience and knowledge from individuals to new colleagues. Attempts to integrate digital technology with existing operations and staff activities have often been unsuccessful, not helped by issues of confidence and trust with some suppliers of digital solutions. Businesses are not helped by what they perceive as a fragmented skills system and a lack of systematic engagement between education and industry.

3.7 Most critically, the fast pace of technological change requires constant upskilling and reskilling of the existing workforce. This tends to mean short sharp interventions – for example to upskill on a new programming language. However, the challenge is that this sits outside of the traditional qualifications framework and so requires new models of delivery. The constant change also challenges teachers and lecturers to keep up with the latest developments as they often find themselves unaware of how digital skills are being applied in the workplace.

3.8 53\% of small businesses in the North West have all 5 of the “Digital Basic Skills” compared to 69\% in London\textsuperscript{14}. The evidence suggests a particular challenge among the smallest firms (for example sole traders), and firms that have been operating for a longer period. 27\% of firms responding to Manchester Digital’s annual skills audit have turned down work because they cannot find the right staff and 32\% of vacancies went unfilled last year\textsuperscript{15}. The ‘Get Digital Heatmap’ produced in 2017 (LGA and LSE) shows the % of adults who have and use the 5 basic digital skills needed for functioning in life and productivity at work across the UK by local authority area. For GM, it indicates that 11\% of people have not been on line in the last three months and 21-25\% lack all 5 basic digital skills. Oldham and Rochdale are the boroughs where residents are most likely to be digitally excluded, and where adults are least likely to have all 5 basic digital skills. Across GM more generally there appears to be a gap between adults gaining all 5 basic digital skills and then actually using them.

\textsuperscript{11} Accenture, ““Digital disruption: The growth multiplier. Optimising digital investments to realize higher productivity and growth””, 2016.
\textsuperscript{12} UK Digital Strategy, 2017
\textsuperscript{13} Lloyds Bank, ““UK Business Digital Index 2017””.
\textsuperscript{14} The Basic Digital Skills measure was created by Doteveryone and partners to measure levels of digital skills among UK adults, and have been recognized by DfE. They are defined as Managing Information, Communicating, Transacting, Problem-Solving, Creating.
\textsuperscript{15} Manchester Digital Audit, 2017
Leadership

3.9 Businesses that are furthest along their digital journey tend to have the right people in leadership with a range of digital know-how in the workforce. This know-how could be coding, data science or digital marketing, but there needs to be an appreciation and understanding in the boardroom, and not just at the front line, that these are the qualities that are needed.

3.10 It is evident from surveys and analysis that there is a large body of SMEs who are less disposed to fundamental digital innovation. Many are busy and stretched, and find it hard to find the time to think about new technology. Therefore driving change is very challenging, and succession planning can be a big issue particularly in family-owned (a factor particularly significant in the GM context), often with a traditional outlook and resistance to change. While early adopters and trend setters in technology adoption are moving ahead at a significant rate, some businesses and sectors run the risk of being left behind.

3.11 Research by Lloyds Bank suggests that as many as 28% of SMEs in the NW (including GM) see going online as simply not relevant – a figure above both the UK average and in comparison to London at only 23%. Likewise a fifth of NW firms see that being online brings benefits in terms of trading overseas but that rises to a third in London.16

3.12 Digital adoption involves change management and ensuring the staff and their views are highly integrated in the process so they engage. Manufacturers, in particular, like to see examples of how other companies have dealt with the practical implications of digital transformation, including how they demonstrate a measurable impact. This suggest the need to generate a range of persuasive use cases and case studies, together with a cohort of business champions willing to demonstrate and promote the uptake of digital technologies in the region. This depends on leaders that understand the value of adopting and diffusing technology within their organization, and be happy to talk about it.

Security and privacy

3.13 In a market dominated by the use of digital technologies, knowledge about customer patterns and behaviours (data) are recognised as of being of increasing importance and sensitivity. Within the European Union these pressures are reflected in the incoming General Data Protection Regulations (GDPR) that will be in force from May 2018 and which will succeed the Data Protection Act in the UK. Increasing volumes of data will pick up a lot of detail about people’s individual lives. This creates further obligations for firms in the area of privacy in terms of information governance and management, and the handling, storage and deletion of personal data for which many organisations, particularly SMEs, are not properly prepared, or may have failed to properly identify and mitigate against the risks. One of the elements of the GDPR is that fine for data protection breaches may potentially be significantly greater than the current £500k ceiling in the UK – potentially up to 4% of global turnover or £20 million.

3.14 In parallel, instances of cyber-crime and cyber-enabled crime have grown significantly in recent years into a highly organised industry. This combination increases both the risk that organisations will suffer an information security breach and in receive a damaging fine with associated reputational damage. In a recent Lloyds Bank, report 32% of small businesses report that concerns around security

16 Lloyds Bank, “UK Business Digital Index 2017”
and fraud are the key barrier to doing more online, and would benefit from more confidence in their internet safety skills\textsuperscript{17}. This can act as a brake on the speedy adoption of digital technologies. The challenge for GM is how to ensure resilience across the business base, mindful of the fact that many firms have still not identified this as a top risk priority for them, lack the agility to respond if information or security is compromised when using digital technologies, and have not dedicated enough budget or invested in skills to respond.

Finance and investment

3.15 Investing in digital technologies can require significant upfront costs for some sectors. Many businesses still see this as a risky venture and are unwilling to properly make the investments that are required either in equipment or in staff. There is no shortage of good ideas, technology inventions or ways to use technology, but what is often missing is the business case to spend the money. Surveys indicates that 17% of SMEs are worried that “doing more online” is too expensive, and a fifth are not convinced it is worth the investment – with the same amount not being clear about the costs involved\textsuperscript{18}.

3.16 It is important to get the message across that adopting digital technology is an investment for a business, not a cost, and making the right business case to invest in a new technology is an absolute must. While 7% of businesses have no sense of their digital plans at all – this rises to 25% among small businesses. Of most concern to businesses are cash availability and skills. For 45% of businesses, not having the money to invest registers as the main barrier to investment, while 33% report they cannot make an adequate case for return on investment.

3.17 The evidence also suggests that UK family-owned business spend less on R&D (significant for digital technologies) than non-family competitors. This is likely reflected in the GM business base which has 90% of total private firms as family-owned - above the London (80%) and UK average (87%). There is a particular concentration of such firms in GM around real estate, and professional services.

Digital Infrastructure

3.18 Having a ubiquitous, affordable, competitive, future-proofed digital infrastructure is a prerequisite for GM becoming a leading digital city region where the adoption of digital technologies is the norm. Full Fibre to the Premises (FTTP) infrastructure is the ultimate in fixed connectivity because it has no known bandwidth ceiling. It enhances competitive advantage by attracting more digital and technology businesses and encouraging innovation in new services and products keen to take advantage of the speeds that FTTP can deliver to our business base and public services. Fibre already play a key role as a backbone supporting mobile connectivity and this will become increasingly important as industry moves to next generation 5G mobile technologies.

3.19 Ofcom confirmed in its recent review that UK has been falling behind its international competitors (UK currently has 2% full fibre to the premises coverage compared with around 60% in Spain and Portugal). The earliest adopters of FTTP in the UK have been larger businesses and organisations. Current FTTP coverage in GM is around 4% in Manchester and parts of Salford. Coverage is less than 1% in most of the other local authority areas.

\textsuperscript{17} Lloyds Bank, “UK Business Digital Index 2017”.
\textsuperscript{18} Lloyds Bank, “UK Business Digital Index 2017”.

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3.20 Part of the reason for the slow market investment in fibre infrastructure is due to only latent demand for the high speeds it can deliver. This means that there is an opportunity for infrastructure providers to work collectively (e.g. through pooling marketing and communications spend to drive home the opportunities that businesses can exploit with fibre speeds. To date the UK’s digital infrastructure remains weak in comparison to leading economies in this field. Surveys suggest that a fifth of small firms see poor connectivity such as slow speeds or no superfast broadband is a barrier\(^{19}\).

4. AREAS FOR POTENTIAL INTERVENTION

4.1 It is clear that a significant number of businesses across GM are still not fully embracing and adopting digital technologies at scale, and the City-Region risks losing significant economic ground and having poorer outcomes for its citizens if it does not take a more pro-active and systematic approach over the coming months and years. The GM Digital Strategy, under development following the Mayor’s recent Digital Summit, is focusing on the areas that should enable GM companies to seize the opportunity presented by “digital”, and it provides a helpful vehicle upon which to suggest and implement initiatives specifically around the mainstream adoption and diffusion of digital technologies. The Digital Strategy will ultimately make a number of wider recommendations in areas such as skills and infrastructure. This report instead aims to ensure specifically that GM achieves economic value from Digital.

4.2 This paper sets out the opportunities from fully embracing digital technologies. The challenge for GM is in predominantly persuading SMEs in particular to modernise their practices by more effectively understanding what the offer is from new technologies, and how they can sensibly manage any risks or over-come barriers. If done successfully then this could bring a significant boost to GM’s economic productivity, and support the move towards greater employment in the “knowledge economy”. Therefore there are benefits in the City-Region being seen as an early mover in this area; as this will attract entrepreneurs, business and investment that acknowledges the market potential.

Leadership

4.3 The widespread adoption of new digital technologies across GM so that the approach becomes main-streamed will ultimately require business leaders to understand the potential and make the necessary investments within their organisations in terms of skills, staff, strategy, process and capital. Without the vision on how digital technology can reshape the market, businesses in GM will fall further behind in terms of global competitiveness.

4.4 Firstly there is an issue around raising awareness amongst leaders of the potential of digital technologies. It’s important to ensure the GM economic strategy and strategic communications make clear that GM recognises the significance of digital technologies and GM is taking active practical steps to support our businesses and employees to seize the opportunities and respond to challenges. **We recommend establishing a GM targeted brand or communications campaign - delivered by both local government and industry - to significantly increase awareness of how new digital technologies can transform industry.** Delivered within a wider support framework, the campaign would promote the adoption of digital technologies (especially among SMEs), address negative preconceptions that IDT is expensive and risky, and inspire current and future workers with a vision of how they can secure high-

\(^{19}\) Lloyds Bank, “UK Business Digital Index 2017”.

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quality jobs in a thriving part of the economy. However, this should go beyond just manufacturing and Industry 4.0, with case-studies of what has worked in all sectors – in order to reassure and inspire.

### 4.5 Secondly, there is a need to continue to better educate business owners of the potential. There is already some support in GM to do this, including workshops and seminars, which explain in simple terms, how to modernise the technology of a business and create stepping stones into the modern digital technology environment. However, this needs to have more resource to effectively scale-up the service to reach a big part of the business base. **We would suggest that the GM BGH has the potential to do this through its new GM Business Productivity and Inclusive Growth Programme aimed at improving productivity in the GM business base.** Paving the way to introducing companies to technologies and issues such as Cloud, Industry 4.0, GDPR, Cyber Security, Back-up and Disaster Recovery, IoT, Big Data Analytics, Drone technology, etc. **There may even be value in adopting an approach similar to that of Liverpool City-Region which triages enquiries from businesses who know that they need to adopt digital but are not sure of what direction to travel** – providing initial advice but then also signposting business leaders to other forms of support to address a problem or develop a new service (including accessing university research). **Local University Business Schools should also think about how they educate the next generation of leaders to embrace new technologies.**

<table>
<thead>
<tr>
<th>Liverpool City Region – Industry 4.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCR 4.0 aims to bring together practical support to transform Liverpool City Region businesses in the manufacturing space by helping them better understand the challenges and opportunities from Industry 4.0 technologies – in order to increase productivity and de-risk innovation. Part-funded by ERDF, the intention is to create a collaborative community that connects SMEs to expertise and support from key knowledge assets in the region.</td>
</tr>
<tr>
<td>A specialist team provides support ranging from R&amp;D, knowledge transfer and the acceleration of ideas from concept through to commercialisation – providing advice and guidance on the potential impact of Industry 4.0 in areas such as:</td>
</tr>
<tr>
<td>• Mass-customisation of products to suit customer demands;</td>
</tr>
<tr>
<td>• Real-time data on processes and equipment;</td>
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<tr>
<td>• More efficient maintenance;</td>
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<tr>
<td>• Accelerated development of better products;</td>
</tr>
<tr>
<td>• Greater resource efficiency;</td>
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<tr>
<td>• Reduced overheads;</td>
</tr>
<tr>
<td>• Opportunities to access new markets and supply chains.</td>
</tr>
<tr>
<td>The programme is focused specifically on SMEs engaged in manufacturing and the supply chain (including big science, life sciences, advanced manufacturing, low carbon and renewable technologies and digital and creative industries) within Liverpool, Sefton, St Helens, Wirral, Halton and Knowsley.</td>
</tr>
</tbody>
</table>

### 4.6 Finally, GM should think about how to encourage the development of peer-support networks where leaders facing similar challenges can share examples of what works. This needs to address the whole range of sectors – where it is likely that different technologies will be used. Possibly by finding a champion that understands the needs and opportunities of each and can encourage momentum. For
example, there is already the executive-led Manufacturing Champions Network, run by the Business Growth Hub, which should do more to embed the competitive and productivity advantages of digital industrialisation across ambitious manufacturers. Perhaps more widely underpinned by a programme to encourage pioneering businesses to provide mentoring and coaching to those that need help in terms of technology adoption in services as well as manufacturing. But also be taking a more nuanced approach to recognize the different needs of individual sectors and sub-sectors to better tailor support.

Skills

4.7 If businesses across GM are going to effectively embed digital technologies within their organisations then it will be crucial to ensure the issue of skills is effectively addressed so that they have people who know how to maximise potential from these technologies. This needs to be considered in two ways. Firstly it’s a question of education of a future and emerging workforce to ensure that there are enough people within the City-Region that have the specialist knowledge, talent, and training to use cutting-edge digital so that GM can be at the forefront globally of such applications. The GM Digital Strategy therefore recognises the importance of strategic action at scale to develop the digital talent pipeline through working with education and leveraging the power of our thriving informal learning sector. As well as to ensure that across the GM population as a whole, people have the right education through school and college to feel comfortable in using digital applications, technology and software in their day to day roles. **Opportunities need to be identified to allow student placements in businesses for those with digital skills in order to understand a business environment and help develop solutions.**

4.8 However, secondly it’s about how to provide support to efforts to re-skill and “up-skill” those generations already in the workplace that may not previously have viewed technology and digital connectedness as the norm. The nature of digital skills that everyone needs as a building block of employment are changing and at pace – more and more jobs now require the use of digital hardware and software, and an understanding of safety/security is absolutely key. GM could do more to support and give profile to initiatives that already exist such as the Google Digital Garage - which has been operating in Manchester as part of a drive to help people and businesses to improve their digital skills for free. **We need a free and easily accessible way for any citizen or business to improve their digital skills – this could include working with stakeholders and businesses to roll out the IDEA Digital Enterprise Award building upon the success achieved by #Digital Wigan.** There could also perhaps be funding that individuals and businesses could access for non-accredited boot-camp/conversion type courses to support reskilling.

4.9 Following the Mayor’s Summit, we know that proposals and actions are being developed separately through the Digital Skills Working Group to consider how GM effectively addresses the digital skills agenda. It is critical that these include actions around re-skilling and up-skilling to ensure the issue of adoption of technologies within firms is addressed by an existing workforce.

Resilience: Cyber-Security and Data Privacy

4.10 GM businesses will ultimately fail to make the significant investments in digital technology they need to unless they are reassured that they can properly manage the associated risks. Partly this is a question around privacy and regulatory requirements – for example about better understanding how to handle customer data and privacy by putting proper internal procedures in place. **Most notably GM needs to ensure that through the Business Growth Hub and the Chambers of Commerce, local businesses properly understand the implications of new European rules around data protection**
(General Data Protection Regulation - GDPR) which will come into effect in 2018, aimed at enabling people to better control their personal data.

4.11 Separately, it is also requires the need to ensure a resilient system that is minimizing the disruption from cyber-attacks from addressing cyber-security concerns, which are likely to be a significant operational issue over coming decades. There are also, of course, economic opportunities from GM businesses being early adopters in this field – as it will place them in a competitive position in terms of selling goods and services in a global marketplace. **GM is already taking steps to position itself as a leading centre for Cyber-Security through “Cyber GM”, and it is important that local businesses are supported as part of this so that they understand and effectively manage any associated risks.**

**Finance and Investment**

4.12 To embed digital technologies in business operations may require an investment upfront – particularly where such an approach may fundamentally change an existing business model. The market is already responding to this by models based around providing an out-sourced digital service or leasing technology. However, where there is a market failure in providing investment finance then the public sector in GM must be able to better provide support where appropriate – particularly where conventional investments in new technology involve greater risk.

4.13 Firstly there is an issue on how to provide a better route to non-traditional funding. For example, **using the opportunity from the establishment of the “Technology Co-Investment Fund” as part of the GM Business Productivity and Inclusive Growth Programme to pro-actively support adoption of digital technology**. This is a seed and early stage co-investment fund that will invest in a range of technologies and innovations. The programme will also be working to develop plans with individual ten GM local authorities, who may additionally be able to lever in some of their funding support. There is also a role to play in helping businesses to write the business case when applying for funding. **Finally, work should be undertaken with the British Business Bank to develop policies or programmes within GM to encourage the adoption locally of digital technologies and facilitate the financing of suitably qualified projects as appropriate.**

4.14 Finally, there is a need to provide some support to business that see such investments as too risky – especially where they need to experiment or pilot a new approach. **For example, to specifically address adoption of digital technologies within firms, GM could also lead some initiatives to ease modernisation for IT capital - developing a programme similar to the Broadband Voucher Scheme for internal IT modernisation potentially helping business owners with matched funding to help them move away from ageing and less secure technology that could be restricting growth.** This could be done in partnership with one of the tech giants. This would help address the challenge that many GM-based businesses are not yet in a position to consider things like IoT, Industry 4.0 or preparing for GDPR as their current infrastructure lacks integration capability. Such a scheme has already been operated by the West Yorkshire Combined Authority which has invested £1m ERDF money to match-fund grants (50%) up to £10k linked to high growth SMEs to invest in ICT (such as 3-D printers) and software.

**Infrastructure**

4.15 We understand that the development of a Digital Infrastructure Implementation Plan is already underway as part of the GMS and a GM Mayoral priority. Working with providers to develop and pilot innovative approaches that can accelerate fibre investment taking advantage of government funding
support (a bid has been made to the Government’s Full Fibre Networks Challenge Fund). As part of this, the Digital Infrastructure Leaders Group is also overseeing work with the mobile industry to develop a 5G mobile pathfinder project to prove 5G technologies and applications and best position GM for early roll-out from 2020.

4.16 It is encouraging that having world class digital infrastructure is a key priority for GM partners but it is essential from a business perspective that such investments are put in place as quickly as possible if firms are to use the latest technologies, and the GM economy is not to lose its competitive edge in comparison to other global City-Region economies.

Fostering research communities

4.17 The challenge remains that the business base are not as connected as they could be to the research within our regional HEIs – it is critical to address so the different sets of partners can work together to understand the nature of new and emerging digital technologies, and how to adapt them to respond to market demand. To help businesses adopt technology will require research institutions across GM – and more widely - to support larger companies and SMEs to understand the benefits of latest developments and to help overcome barriers to its use. There are already a number of outward-facing centres and faculties that can provide this engagement – geared more strongly towards the commercialization of science (for example the GEIC and the Royce Institute). Additionally there are lessons that can be learnt on digital application from the CityVerve Internet of Things (IoT) City Demonstrator. The lessons from these needed to be articulated and disseminated. There are also a number of significant capital assets across GM and the surrounding geographies (for example the Hartree Centre at Daresbury, or the HVM AMRC in Sheffield) which GM businesses (especially SMEs) could be better sign-posted towards, and supported to access.

4.18 GM will also need to continue to develop centres of excellence in technologies that will transform the future of operations will help ensure the GM’s continued competitiveness and provide great export and business opportunities for GM firms – building on the assets already identified through the 2016 Science and Innovation Audit. This will require engagement with the Government’s Industrial Strategy Challenge Fund. Examples include applying for NESTA Flying High Drones in Cities challenge – which could draw in the North West Aerospace Alliance and TfGM; the UoM Pankhurst Centre; or projects such as MMU around “Print City” (3-D Printing) to help business harness the creative applications of data driven technology. However, it is critical for partners across GM to join-up more effectively to coordinate.

Working with government and wider partners

4.19 It is encouraging to see the announcement at the Mayor’s Digital Summit in December, that the Digital Catapult and the GMCA will establishment a strategic partnership to accelerate the city’s digital ambition. This strategic alliance will enable GM to access the networks, expertise and influence that comes from working with a national catapult, accelerating the process of becoming a leading digital city. Attracting investment to the city-region, providing access to investor communities, and improving the take up of catapult programmes by companies and within the GM public sector. The next step needs to be to establish a work plan with the Digital Catapult to better understand GM’s levels of awareness of and preparedness for industrial digitisation, barriers to adoption, and the scale of the opportunity if adoption can be accelerated. We believe this plan should include not only areas such as digital manufacturing, creative industries, cyber, digital infrastructure and health; but also to look at
other sectors including retail, public sector and financial services. **However, GM also needs to think about how it reinforces linkages with other catapults that can support the agenda around digital technologies** – including the HVM Catapult in Sheffield.

4.20 In the **Industrial Strategy** White Paper published in December the Government noted the importance of digital technologies and the need for the UK business base to fully embrace this in order to remain competitive in the wider global economy. **Policy-makers in GM need to work closely with key departments such as BEIS and Treasury but also agencies such as InnovateUK and UKRI (from April) to help shape strategic thinking and policy delivery in relation to place – identifying suitable funding opportunities from the Industrial Strategy Challenge Fund. As well as to coordinate responses more effectively at the GM level.**

4.21 The Made Smarter Review recommends the introduction of a new National Adoption Programme which would accelerate the development and diffusion of IDT through focused support to SMEs so that it brings benefits to local businesses – in GM this could ideally be owned by the LEP and delivered by accredited regional partners. Investment would be targeted at strengthening both the capability and capacity of advisory services in digital technologies. It would provide kick-start funding for companies to leverage assets and expertise within the ecosystem. It could also increase the mentoring offered by industry and strengthen the interaction with upcoming talent within universities through focused projects and placements. **Local partners need to work closely to ensure that the suite of sector deals are implemented and reflect the priorities of the City-Region; this includes the Made Smarter review on industrial digitalisation where it makes a number of important recommendations that may be taken forward in GM, and better co-ordinate a joined up GM response.**

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20 Juergen Maier, ‘*Made Smarter. Review*’, December 2017
### Summary of recommended actions

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>ACTIONS</th>
<th>LEAD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Leadership</strong></td>
<td>• Establish a GM targeted brand or communications campaign to increase awareness of how new digital technologies can transform industry. Alongside a plan to better educate business owners of the potential of digital technologies (scaling-up reach through the new GM Business Productivity and Inclusive Growth Programme).&lt;br&gt;• Encourage more peer-support networks where leaders can share examples of what works in particular sectors.&lt;br&gt;• Use local University Business Schools to educate the next generation of leaders to embrace new technologies.&lt;br&gt;• Consider whether GM needs an Industry 4.0 programme along the lines of Liverpool City-Region.</td>
<td>GMCA, BGH, Chambers, LAs, BGH, Business organisations, GM HEIs, GM LEP</td>
</tr>
<tr>
<td><strong>Skills</strong></td>
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</tr>
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<td><strong>Resilience</strong></td>
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<td>BGH, Chambers, GMCA</td>
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<td>• Use the opportunity from the establishment of the “Technology Co-Investment Fund” as part of the GM Business Productivity and Inclusive Growth Programme to pro-actively support adoption of digital technology.&lt;br&gt;• Explore with the British Business Bank how to develop programmes within GM to encourage adoption locally of digital technologies.&lt;br&gt;• Consider whether a programme similar to the Broadband Voucher Scheme for internal IT modernisation in Leeds could work in GM.</td>
<td>BGH, GMCA, MGC, GMCA, British Business Bank</td>
</tr>
<tr>
<td><strong>Infrastructure</strong></td>
<td>• Ensure that strong digital infrastructure is in place across the City-Region – especially 5G.</td>
<td>GMCA</td>
</tr>
<tr>
<td><strong>Fostering research</strong></td>
<td>• Better articulate and disseminate case studies from assets that support digital transformation such as CityVerve, Daresbury, Corridor Manchester etc to highlight the support on offer to business.</td>
<td>GM HEIs, Hartree Centre, BGH, Digital Catapult</td>
</tr>
<tr>
<td><strong>Working with government</strong></td>
<td>• Consider how GM can better reinforces linkages with other catapults that can support the agenda around digital technologies. Meanwhile work with key departments and InnovateUK/ UKRI to help shape strategic thinking on digital technology (ICSF) – particularly idea of NW pilot as part of the Made Smarter review.</td>
<td>Digital Catapult, InnovateUK, BEIS GMCA, HEIs</td>
</tr>
</tbody>
</table>
5 GOVERNANCE AND NEXT STEPS

5.1 Work is currently underway to finalise the Digital Strategy for GM, following on from the Mayor’s Digital Summit on 8 December where the ambition was set for GM to be recognised as a global digital city region. This work has been led by the GMCA, and the strategy will be accompanied by a Digital Action Plan to support implementation. The issues and actions proposed by this LEP Task and Finish Group have formed the basis for part of that wider strategy, with actions potentially embedded within that plan. This will provide a governance mechanism to oversee progress towards delivering aspirations to accelerate the adoption and diffusion of digital technologies by GM businesses.

5.2 It is particularly important that the issues identified are not treated in isolation, but that are considered in wider efforts such as the development of a GM Digital Infrastructure Implementation Plan, GM-Connect, Greater Connected (run by the BGH), and Cyber GM. Critically, it is key that the adoption of digital technologies is not seen as a generic issue that can cut equally across all businesses and all sectors. If GM is to make genuine progress in this area, it must show that it is recognised that there are specific sector perspectives and associated actions - for example the needs of retail will be different from healthcare, and they are likely in many case to be using different technologies. It is beyond the scope of this T&F Group to do this properly, but instead it will need to be addressed as part of the way forward on the wider GM Digital Strategy.
REFERENCES


• Digital Catapult, “Driving the UK economy through digital innovation”, February 2017.


• Lloyds Bank, “UK Business Digital Index 2017”.


• KPMG, “Rethink manufacturing: Designing a UK industrial strategy for the age of Industry 4.0”

• Survey carried out by The Manufacturer, and sponsored by Oracle.

• EEF, “4IR: Evolving your business”


• Regeneris, “Opportunities for Growth in GM Manufacturing”

• GMCA, “Greater Manchester Business Survey”
Task & Finish: Accelerating adoption of Digital Technologies in GM

- **Objective:** To identify ways that the City-Region can better support local businesses to accelerate the adoption of digital technologies in order to maximise their growth and productivity, and be fully competitive in the developing global economy.

  - Identifying opportunity to be seized: By 2025 the economy is likely to be already highly digitised. If the full potential of digital technology were realised then worth additional £600m a year above baseline of £60bn.

  - Barriers to be addressed: Skills; Leadership; Security/ Privacy; Finance/ Investment; Infrastructure.

Approach

- Have considered how the issue impacts **across all sectors** (not just manufacturing). And the fact different technologies will be **deployed in different parts** of a business.

- Did not, however, develop **sector specific propositions** as this is beyond the remit of this group.

- Report builds on **existing research** conducted internally/externally; Comments from T&F Panel, Key business reps, and GM LEP members.

- Direct link to **GM Digital Strategy** - in order to ensure governance/implementation of actions.
References

• Digital Catapult, “Driving the UK economy through digital innovation”, February 2017.
• KPMG, “Rethink manufacturing: Designing a UK industrial strategy for the age of Industry 4.0”.
• Survey carried out by The Manufacturer, and sponsored by Oracle.
• EEF, “4IR: Evolving your business”.
• Regeneris, “Opportunities for Growth in GM Manufacturing”.
• GMCA, “Greater Manchester Business Survey”.
• Institute for Family Business, “The State of the Nation: The UK Family Business Sector 2016/17”.
• Lloyds Bank, “UK Business Digital Index 2017”.
Input

- Chair: David Birch
- T&F Group: Mark Hughes (The Growth Company), Leanne Holmes (Cranes Payment Innovation), John Falder (HMG Paints), Adrienne Tonge (Synectic Electronics), and Carole Pearson (Marks and Spencer).
- Additional input from the Federation of Small Businesses (FSB), as well as engagement with the West Yorkshire Combined Authority and the Liverpool City Region LEP. Contributions to the final report have also been made by a number of GM LEP members.
- Support on writing the report has been provided by Michael Contaldo (GMCA).
### Barriers to adoption

**Skills**
- Businesses need skills within workforce to use digital technologies effectively.
- Partly around investing in generic digital skills in the general population at large.
- Also about ensuring talent and specialised digital skills within the GM system.
- Key issue of upskilling/reskilling existing workforce so they are able to engage effectively with new technologies.

**Leadership**
- Many businesses risk failure to prioritise new technology. But requires active change management, examples of where its worked elsewhere, case studies and championing.
- Issue of raising awareness amongst leaders of potential of digital technologies.
- More action needed to better educate business owners of the types of technologies and how to deploy them.
- Opportunities form peer-support networks where leaders facing similar challenges can share examples of what works.
## Barriers to adoption

| Security                      | - Data on customers provides value. But issues around cyber-crime need to be addressed. Lack of confidence in trust.  
|                              | - Lack of understanding of privacy and regulatory requirements - for example how to handle customer data sensitively or to implement General Data Protection Regulation - poses risks. |
| Finance                       | - Can require significant upfront investments. Issues around risk, uncertainty on which technology is most appropriate. Failure to commit enough R&D spend. |
| Infrastructure                | - Ubiquitous, affordable, competitive, future-proofed digital infrastructure prerequisite for wide-scale digital adoption.  
|                              | - To date the UK (and GMs) infrastructure remains weak compared to leading economies in this field. Presents a particular challenge for smaller firms. |
## Proposed actions

| Leadership | • Establish GM targeted brand or communications campaign to increase awareness of how new digital technologies can transform industry. Alongside plan to better educate business owners of the potential of digital technologies.  
| • Encourage more peer-support networks where leaders can share examples of what works in particular sectors.  
| • Use local University Business Schools to educate the next generation of local leaders to embrace new technologies.  
| • Consider whether GM needs an Industry 4.0 programme along the lines of Liverpool City-Region. |
| Skills | • Identify more opportunities that allow student placements in businesses for those with digital skills in order to understand a business environment and help develop solutions. |
| Resilience | • Ensure local businesses properly understand the implications of new European rules around data protection (General Data Protection Regulation - GDPR) which will come into effect in 2018.  
| • Maintain progress for GM to become a leading centre for Cyber-Security. |
| Infrastructure | • Ensure that strong digital infrastructure is in place across the City-Region - especially 5G but full fibre to the premise, if GM is not to lose its competitive edge in comparison to other city-region economies. |
## Proposed actions

| Finance & Investment | Use the opportunity from the establishment of the “Technology Co-Investment Fund” as part of the GM Business Productivity and Inclusive Growth Programme to pro-actively support adoption of digital technology.  
|                    | • Explore with the British Business Bank how to develop programmes within GM to encourage adoption locally of digital technologies.  
|                    | • Consider whether a programme similar to the Broadband Voucher Scheme for internal IT modernisation in Leeds could work in GM. |
| Research assets    | Better articulate and disseminate case studies from assets that support digital transformation such as CityVerve, Daresbury, Corridor Manchester etc to highlight the support on offer to business. |
| Working with government | Consider how GM can better reinforces linkages with other catapults that can support the agenda around digital technologies. Meanwhile work with key departments and InnovateUK/ UKRI to help shape strategic thinking on digital technology (ICSF) - particularly idea of NW pilot as part of the Made Smarter review. |
Next Steps:

- Work already feeding into development of GM Digital Strategy.
- Need to conduct further work on ensuring there is a better understanding of specific sectors within the economy - to avoid being too generic in the GM approach.
- Work with Digital Catapult to identify suitable measure that can go into the GM Digital Strategy to help understand whether progress is being made.