

Scrutiny Inquiry Panel - Future of Work in Southampton

Thursday, 17th January, 2019
at 6.00 pm

PLEASE NOTE TIME OF MEETING

Conference Rooms 3 & 4 - Civic Centre

This meeting is open to the public

Members

Councillor McEwing (Chair)
Councillor Fitzhenry (Vice-Chair)
Councillor Bogle
Councillor Coombs
Councillor Furnell
Councillor Guthrie
Councillor Laurent

Democratic Support Officer
Emily Goodwin
Tel. 023 8083 2302
Email: emily.goodwin@southampton.gov.uk

Contact

Scrutiny Manager
Mark Pirnie
Tel: 023 8083 3886
Email: mark.pirnie@southampton.gov.uk

PUBLIC INFORMATION

Role of Scrutiny Panel Inquiry – Future of Work in Southampton

The Overview and Scrutiny Management Committee have instructed the Scrutiny Panel to undertake an inquiry into the Future of Work in Southampton.

Purpose: To consider how Southampton can maximise the opportunities created by artificial intelligence, automation and technological changes whilst seeking to mitigate the potential disruption to the labour market.

Use of Social Media:- The Council supports the video or audio recording of meetings open to the public, for either live or subsequent broadcast. However, if, in the Chair's opinion, a person filming or recording a meeting or taking photographs is interrupting proceedings or causing a disturbance, under the Council's Standing Orders the person can be ordered to stop their activity, or to leave the meeting. By entering the meeting room you are consenting to being recorded and to the use of those images and recordings for broadcasting and or/training purposes. The meeting may be recorded by the press or members of the public. Any person or organisation filming, recording or broadcasting any meeting of the Council is responsible for any claims or other liability resulting from them doing so. Details of the Council's Guidance on the recording of meetings is available on the Council's website.

The [Southampton City Council Strategy \(2016-2020\)](#) is a key document and sets out the four key outcomes that make up our vision.

- Southampton has strong and sustainable economic growth
- Children and young people get a good start in life
- People in Southampton live safe, healthy, independent lives
- Southampton is an attractive modern City, where people are proud to live and work

Public Representations

At the discretion of the Chair, members of the public may address the meeting about any report on the agenda for the meeting in which they have a relevant interest.

Smoking policy – the Council operates a no-smoking policy in all civic buildings.

Mobile Telephones – please turn off your mobile telephone whilst in the meeting.

Fire Procedure – in the event of a fire or other emergency a continuous alarm will sound and you will be advised by Council officers what action to take.

Access – access is available for the disabled. Please contact the Democratic Support Officer who will help to make any necessary arrangements.

Dates of Meetings: Municipal Year

2018	2019
20 September	17 January
18 October	7 February
20 December	21 March

CONDUCT OF MEETING

TERMS OF REFERENCE

The general role and terms of reference of the Overview and Scrutiny Management Committee, together with those for all Scrutiny Panels, are set out in Part 2 (Article 6) of the Council's Constitution, and their particular roles are set out in Part 4 (Overview and Scrutiny Procedure Rules – paragraph 5) of the Constitution.

BUSINESS TO BE DISCUSSED

Only those items listed on the attached agenda may be considered at this meeting.

RULES OF PROCEDURE

The meeting is governed by the Council Procedure Rules and the Overview and Scrutiny Procedure Rules as set out in Part 4 of the Constitution.

QUORUM

The minimum number of appointed Members required to be in attendance to hold the meeting is 3.

DISCLOSURE OF INTERESTS

Members are required to disclose, in accordance with the Members' Code of Conduct, **both** the existence **and** nature of any "Disclosable Pecuniary Interest" or "Other Interest" they may have in relation to matters for consideration on this Agenda.

DISCLOSABLE PECUNIARY INTERESTS

A Member must regard himself or herself as having a Disclosable Pecuniary Interest in any matter that they or their spouse, partner, a person they are living with as husband or wife, or a person with whom they are living as if they were a civil partner in relation to:

- (i) Any employment, office, trade, profession or vocation carried on for profit or gain.
- (ii) Sponsorship:

Any payment or provision of any other financial benefit (other than from Southampton City Council) made or provided within the relevant period in respect of any expense incurred by you in carrying out duties as a member, or towards your election expenses. This includes any payment or financial benefit from a trade union within the meaning of the Trade Union and Labour Relations (Consolidation) Act 1992.

(iii) Any contract which is made between you / your spouse etc (or a body in which the you / your spouse etc has a beneficial interest) and Southampton City Council under which goods or services are to be provided or works are to be executed, and which has not been fully discharged.

(iv) Any beneficial interest in land which is within the area of Southampton.

(v) Any license (held alone or jointly with others) to occupy land in the area of Southampton for a month or longer.

(vi) Any tenancy where (to your knowledge) the landlord is Southampton City Council and the tenant is a body in which you / your spouse etc has a beneficial interests.

(vii) Any beneficial interest in securities of a body where that body (to your knowledge) has a place of business or land in the area of Southampton, and either:

- a) the total nominal value for the securities exceeds £25,000 or one hundredth of the total issued share capital of that body, or

- b) if the share capital of that body is of more than one class, the total nominal value of the shares of any one class in which you / your spouse etc has a beneficial interest that exceeds one hundredth of the total issued share capital of that class.

Other Interests

A Member must regard himself or herself as having an 'Other Interest' in any membership of, or occupation of a position of general control or management in:

Any body to which they have been appointed or nominated by Southampton City Council

Any public authority or body exercising functions of a public nature

Any body directed to charitable purposes

Any body whose principal purpose includes the influence of public opinion or policy

Principles of Decision Making

All decisions of the Council will be made in accordance with the following principles:-

- proportionality (i.e. the action must be proportionate to the desired outcome);
- due consultation and the taking of professional advice from officers;
- respect for human rights;
- a presumption in favour of openness, accountability and transparency;
- setting out what options have been considered;
- setting out reasons for the decision; and
- clarity of aims and desired outcomes.

In exercising discretion, the decision maker must:

- understand the law that regulates the decision making power and gives effect to it. The decision-maker must direct itself properly in law;
- take into account all relevant matters (those matters which the law requires the authority as a matter of legal obligation to take into account);
- leave out of account irrelevant considerations;
- act for a proper purpose, exercising its powers for the public good;
- not reach a decision which no authority acting reasonably could reach, (also known as the "rationality" or "taking leave of your senses" principle);
- comply with the rule that local government finance is to be conducted on an annual basis. Save to the extent authorised by Parliament, 'live now, pay later' and forward funding are unlawful; and
- act with procedural propriety in accordance with the rules of fairness.

AGENDA

1 APOLOGIES AND CHANGES IN PANEL MEMBERSHIP (IF ANY)

To note any changes in membership of the Panel made in accordance with Council Procedure Rule 4.3.

2 DISCLOSURE OF PERSONAL AND PECUNIARY INTERESTS

In accordance with the Localism Act 2011, and the Council's Code of Conduct, Members to disclose any personal or pecuniary interests in any matter included on the agenda for this meeting.

3 DECLARATIONS OF SCRUTINY INTEREST

Members are invited to declare any prior participation in any decision taken by a Committee, Sub-Committee, or Panel of the Council on the agenda and being scrutinised at this meeting.

4 DECLARATION OF PARTY POLITICAL WHIP

Members are invited to declare the application of any party political whip on any matter on the agenda and being scrutinised at this meeting.

5 STATEMENT FROM THE CHAIR

6 MINUTES OF THE PREVIOUS MEETING (INCLUDING MATTERS ARISING) (Pages 1 - 4)

To approve and sign as a correct record the Minutes of the meeting held on 20 December 2018 and to deal with any matters arising.

7 THE FUTURE OF WORK IN SOUTHAMPTON – WHAT IS REQUIRED FOR SOUTHAMPTON TO BECOME A CENTRE FOR AI, ROBOTICS, SMART AUTOMATION AND THE DIGITAL ECONOMY? (Pages 5 - 22)

Report of the Director, Legal and Governance, requesting that the Panel consider the comments made by the invited guests and use the information provided as evidence in the review.

Wednesday, 9 January 2019

Director of Legal and Governance

This page is intentionally left blank

SCRUTINY INQUIRY PANEL - FUTURE OF WORK IN SOUTHAMPTON

MINUTES OF THE MEETING HELD ON 20 DECEMBER 2018

Present: Councillors McEwing (Chair), Fitzhenry (Vice-Chair), Bogle, Coombs, Furnell and Laurent

Apologies: Councillors Guthrie

6. **APOLOGIES AND CHANGES IN PANEL MEMBERSHIP (IF ANY)**

The apologies of Councillor Guthrie were noted.

7. **MINUTES OF THE PREVIOUS MEETING (INCLUDING MATTERS ARISING)**

RESOLVED that the minutes of the meeting held on 18 October, 2018 be approved and signed as a correct record.

8. **THE FUTURE OF WORK IN SOUTHAMPTON - ENSURING THAT THE SOUTHAMPTON WORKFORCE HAS THE REQUIRED SKILLS TO STAY AHEAD OF THE ROBOTS**

The Panel received the report of the Director, Legal and Governance, requesting that the Panel consider the steps that are being undertaken to secure the right skills to drive the data driven economy in Southampton and how the Southampton workforce can acquire the required skills to stay ahead of the robots.

Following discussions with invited representatives the following information was received:

Professor Dame Wendy Hall - Regius Professor of Computer Science at the University of Southampton, Executive Director of the Web Science Institute and Skills Champion for AI in the UK

Securing the right skills to drive the data driven economy in Southampton

- The UK is strong in AI and has a remarkable legacy. The Government's AI sector deal is ambitious and world leading.
- The University of Southampton is strong in AI and technology and is a member of the Turing Institute.
- UK and Southampton need more people with Science, Technology, Engineering and Maths skills, especially females, as the new jobs created will require skills in science and technology. The more skills and the higher the skills the better.
- The city needs a pipeline of people studying for science and technology degrees and a pipeline to PhD's. There also needs to be opportunities for people to retrain and move into this field of work.
- The University of Southampton hosts a Web Sciences Centre for Doctoral Training funded by the UK Research Council. A bid by the University to become an Artificial Intelligence Centre for Doctoral Training is being evaluated. These initiatives are in addition to the various PHD's and research opportunities, in relevant disciplines to grow the tech industry, supported by the University.

- On-line learning can be an integral element of the skills jigsaw, helping to increase diversity of learners. The Southampton Data Science Academy, part of the Web Science Institute, was established to bridge the data skills gap and delivers a number of accredited on-line modular courses in data science. More can be done in Southampton to provide effective on line education to develop tech skills.
- Every country and university wants the top AI researchers. Keeping people in the UK is difficult because in the USA investment funding is easier to access and salaries can be significantly higher.
- To attract top talent the city needs to be open to people from across the globe coming to learn in Southampton and being supported to stay and grow here. We also need to recognise that there are opportunities to become a talent magnet and a developer of talent and accept that some talent will leak out of the system, possibly to return later. We need to create an environment that supports this.
- The Government is providing funding to create a National Centre for Computing Education to train teachers - <https://teachcomputing.org/>

Cllr Darren Paffey – Cabinet Member for Aspiration, Skills and Lifelong Learning
Geoff Glover – Associate Lecturer, Southampton Solent University, Chair of the emerging Southampton Education Quarter Forum
Sarah Stannard – Principal and Chief Executive, City College Southampton and Chair of the Southampton Careers Inspiration Group
Denise Edghill - Interim Service Director for Growth, Southampton City Council
Sajid Butt – Strategic Skills Manager, Southampton City Council

How the Southampton workforce can acquire the required skills to stay ahead of the robots?

- Moving forward there is a need for everyone to be digitally literate and have social skills.
- In Southampton there is a skills mismatch between where we are now and where we need to be. There has never been a worse time to not have the required skills.

Skills - Young People

- We need to make 'invisible' jobs visible. Too many young people in Southampton do not see the range of opportunities available. We need them to have experiences of work as early as possible to raise aspirations.
- The Southampton Careers Inspiration Group, with Education Business Partnership South, run an event annually called 'Get Inspired'. Employers show children a range of new opportunities that are available. 1200 pupils from Southampton schools attended this year's event with all but 1 school in the city attending.
- The new Careers Strategy is immensely helpful and it is welcome news that the Solent has been selected for Careers Hub funding (One of 20 areas in the country – funding comes through the Local Enterprise Partnership to help transform careers education and improve links between schools and business.
- Encouraging signs that the change in leadership at Ofsted might change the culture of 'teach to test' in UK schools, hopefully embracing a more holistic education with more emphasis on soft skills, learning and careers advice.

- T-Levels – Designed to create parity of esteem between academic and vocational education, Technical Levels are due to commence in 2020. Part of the course will include industrial placements.
- The Southern Universities Network (SUN) is a collaborative partnership comprising Higher Education (HE) providers in Hampshire, Dorset and the Isle of Wight. The SUN provides outreach activities for schools and colleges. The SUN has been tasked with increasing HE participation in over 70 wards, working with 101 schools and all further education (FE) colleges in the region. As directed in Office for Students' guidance, work will be focused on young people in Years 9 – 13 and their 'key influencers'. A number of these key wards are in Southampton.
- It is predicted that, within 20 years, 90% of all jobs will require some element of digital skills (Department for Digital, Culture, Media and Sport 2017 – UK Digital Strategy). Effective digital skills training is essential to ensure that the Southampton workforce is prepared for future technological changes.
- Reflecting initiatives in London (Digital Talent Programme), Bristol (Young Future Bristol) and the West Midlands (Digital Skills Partnership), the Institute of Coding have been invited to Southampton to see how we can work together to enhance coding skills in the city.

A Learning Culture

- Around 90% of the current workforce will be working in 10 years' time (Solent Local Enterprise Partnership). The skills profile of the Solent, including Southampton, needs to improve. There is a need to inspire the community to learn and re-learn continuously throughout a working life.
- Funding for formal adult education has diminished. City College used to have 12,000 adult education students annually, there are now 3,000 adult learners. The Council delivers support to 3,500 adult learners, this used to be 5,000.
- However, significant levels of funding still being spent on training in the city but this is less likely to be undertaken through formal channels in a classroom. More training is online. This can result in duplication and less co-ordination of training activity across the city. Co-operation between the education and training providers and corporate businesses in Southampton could help increase the quality, diversity and accessibility of learning opportunities in the city.
- After a successful funding bid Southampton City Council will be delivering, on behalf of the Solent region, an Apprenticeship Hub. Plans include making it easier for Small to Medium-sized Enterprises to engage with the Apprenticeship Levy, and potentially work with business to pool the 10% share of the Levy that Levy paying firms can share with other businesses to deliver a collective skills offer to the city.
- There was recognition that the skills landscape is complicated for employers. The Council can play a key role in supporting local organisations to get the training they require.
- Southampton Education Quarter – This is work in progress but the concept is that this will be a physical area that inspires people to want to develop skills. The Council is engaging with Solent University, University of Southampton and City College to develop the vision. It is recognised that there are examples of good practice nationally and internationally but that a different approach, tailored to the resources and needs of the city, may be required to improve the culture of learning in Southampton.

- There was recognition that leadership skills were of paramount importance and that the City Council could set an example by ensuring suitable training is provided to staff and elected members.

RESOLVED that the comments made by Professor Dame Wendy Hall - Regius Professor of Computer Science at the University of Southampton, Executive Director of the Web Science Institute and Skills Champion for AI in the UK; Cllr Darren Paffey – Cabinet Member for Aspiration, Skills and Lifelong Learning; Geoff Glover – Associate Lecturer, Southampton Solent University, Chair of the emerging Southampton Education Quarter Forum; Sarah Stannard – Principal and Chief Executive, City College Southampton and Chair of the Southampton Careers Inspiration Group; Denise Edghill - Interim Service Director for Growth, Southampton City Council; and Sajid Butt – Strategic Skills Manager, Southampton City Council be noted and used as evidence in the review.

Agenda Item 7

DECISION-MAKER:	SCRUTINY INQUIRY PANEL		
SUBJECT:	THE FUTURE OF WORK IN SOUTHAMPTON – WHAT IS REQUIRED FOR SOUTHAMPTON TO BECOME A CENTRE FOR AI, ROBOTICS, SMART AUTOMATION AND THE DIGITAL ECONOMY?		
DATE OF DECISION:	17 JANUARY 2019		
REPORT OF:	DIRECTOR – LEGAL AND GOVERNANCE		
<u>CONTACT DETAILS</u>			
AUTHOR:	Name:	Mark Pirnie	Tel: 023 8083 3886
	E-mail:	Mark.pirnie@southampton.gov.uk	
Director	Name:	Richard Ivory	Tel: 023 8083 2794
	E-mail:	Richard.ivory@southampton.gov.uk	
STATEMENT OF CONFIDENTIALITY			
None			
BRIEF SUMMARY			
In accordance with the inquiry plan, for the fourth meeting of ‘The Future of Work in Southampton Inquiry’ the Panel will be considering how Southampton can benefit from the rapidly expanding technology sector and become a centre for AI, robotics, smart automation, and the digital economy.			
RECOMMENDATIONS:			
	(i)	The Panel is recommended to consider the comments made by the invited guests and use the information provided as evidence in the review.	
REASONS FOR REPORT RECOMMENDATIONS			
1.	To enable the Panel to compile a file of evidence in order to formulate findings and recommendations at the end of the review process.		
ALTERNATIVE OPTIONS CONSIDERED AND REJECTED			
2.	None		
DETAIL (Including consultation carried out)			
3.	The 2018 Tech Nation report identified that the UK has 2.1 million digital tech jobs, and that employment rose 13.2% between 2014 and 2017 in the digital tech sector. ¹		
4.	Jobs requiring digital tech skills command higher salaries, on average, £42,578 compared to £32,477 per year and the more digitally skilled a UK job is the higher its average annual salary. ² The Panel have also been informed that by one estimate, AI could add £232bn to the UK economy by 2030 ³ .		

¹ Tech Nation Report 2018, Tech City UK, <https://technation.io/insights/report-2018/jobs-and-skills/>

² Tech Nation Report 2018, Tech City UK, p22

³ PwC (2017), ‘Sizing the prize, PwC’s Glob-al Artificial Intelligence Study: Exploiting the AI Revolution’ <https://www.pwc.com/gx/en/issues/data-and-analytics/publications/artificial-intelligence-study.html>

The Technology Sector in Southampton

5.

Southampton

£2.1 bn digital tech business turnover up
41% from 2014 to 2017

£2.1 bn

Digital tech business
turnover (2017)

Balanced

Dominant distribution
of businesses by age
(2017)

£192 k

Digital tech turnover
by employee (2017)

145

Digital tech
business births
(2016)

£1.4

bn
GVA
(2017)

10,950

Jobs in digital
tech
(2017)

29,567

Digital tech jobs
(2017)

Source – Tech UK 2018 report - <https://technation.io/insights/report-2018/southampton/>

Digital tech jobs – includes all people working in digital tech occupations, irrespective of the industry. For example, a software developer working in a retail company.

Jobs in digital tech – includes all people working in digital tech industries, including non-digital jobs. For example, an accountant working in a web development firm.

6.

Southampton was recently identified as a technology ‘Super Cluster’ in a report published by CBRE, the world’s largest commercial real estate investment firm. The report, *EMEA Tech Cities: Opportunities in Technology Hotspots*⁴, identifies four separate categories of technology cluster based on a city’s level, concentration and growth of tech sector employment.



Between 2010-16 high-tech employee numbers grew 25%, ranking Southampton individually fifth out of the 23 cities covered in the report. A particular focus on ‘knowledge-intensive’ employment over the same period also saw a greater increase, of 50%, putting Southampton in the top 3 cities.

⁴ EMEA Tech Cities - Opportunities In Technology Hotspots, CBRE, September 2018

	Catalysts for UK Digital Tech Growth and Innovation
7.	Whilst recognising that nurturing and growing the vitally important technology sector requires the collaboration of a great many stakeholders, including start-ups, scale-ups, universities, investors, the Government, local governments and corporates, the Tech Nation 2017 report, ⁵ following analysis of feedback from digital tech founders and community leaders, identified six key areas that could act as catalysts for growth in digital technology in the UK.
8.	Three out of the six catalysts relate to skills and diversity and were discussed at meeting 3 of the inquiry. These are: <ul style="list-style-type: none"> • Skilling up for digital business • Gender diversity • Attract the best and brightest global talent
9.	The remaining three catalysts that have been identified as important elements that can help to grow the technology sector are as follows: <ul style="list-style-type: none"> • Access to finance, at every stage of growth • Boost digital connectivity • Physical spaces for company formation and growth
	Access to finance, at every stage of growth
10.	In the Tech Nation 2017 report over 40% of digital tech founders or businesses reported that access to funding is a significant business challenge. The report recognises that although not every company needs venture capital or loans to fuel their growth, improving access to capital can make all the difference to international competitiveness, especially for high growth companies. The Tech UK report concludes that this could be achieved through: <ul style="list-style-type: none"> • Nurturing and developing local angel networks • Patient Capital (long-term capital) • Harnessing the power of universities – UK universities can provide crucial access to funding and practical business support for their students and alumni.
	Boost digital connectivity
11.	The Tech UK survey identified that almost one third (30%) of founders and CEOs said digital infrastructure continues to present a challenge. Investment is essential if businesses are to thrive and grow. In the UK, fixed internet traffic is now set to double every two years ⁶ , whilst mobile data traffic will increase at a rate of between 25% and 42% per year ⁷ . In order to meet this rising demand the Tech UK report recommends continuing to increase access to Ultra-Fast Fibre to the Premises (FTTP).

⁵ Tech Nation 2017 report, Tech City UK, p41-42

⁶ Fixed internet traffic worldwide: Forecasts and Analysis 2012 - 2018, Analysis Mason (2015).

⁷ Mobile Data Strategy, Ofcom

	Physical spaces for company formation and growth																				
12.	The Tech Nation 2017 survey identified that co-working spaces play a vital role in successful digital tech ecosystems. Almost three quarters (74%) of survey respondents who had used co-working spaces rated them as useful.																				
	<p>Figure 1 – Key Challenges Faced by Digital Tech Businesses</p> <table border="1"> <thead> <tr> <th>Challenge</th> <th>% of responses</th> </tr> </thead> <tbody> <tr> <td>Skilled Talent Supply</td> <td>55%</td> </tr> <tr> <td>Financing Opportunities</td> <td>32%</td> </tr> <tr> <td>Transport infrastructure</td> <td>29%</td> </tr> <tr> <td>Digital Infrastructure</td> <td>28%</td> </tr> <tr> <td>Affordable Office Space</td> <td>28%</td> </tr> <tr> <td>Awareness of Tech Sector</td> <td>28%</td> </tr> <tr> <td>Talent Retention</td> <td>24%</td> </tr> <tr> <td>Regulation</td> <td>19%</td> </tr> <tr> <td>Mentoring and Advice</td> <td>17%</td> </tr> </tbody> </table> <p><i>Source: Tech Nation Survey, 2017</i></p>	Challenge	% of responses	Skilled Talent Supply	55%	Financing Opportunities	32%	Transport infrastructure	29%	Digital Infrastructure	28%	Affordable Office Space	28%	Awareness of Tech Sector	28%	Talent Retention	24%	Regulation	19%	Mentoring and Advice	17%
Challenge	% of responses																				
Skilled Talent Supply	55%																				
Financing Opportunities	32%																				
Transport infrastructure	29%																				
Digital Infrastructure	28%																				
Affordable Office Space	28%																				
Awareness of Tech Sector	28%																				
Talent Retention	24%																				
Regulation	19%																				
Mentoring and Advice	17%																				
13.	<p>The 2017 Tech Nation survey identified the following growth challenges to the tech industry in Southampton⁸:</p> <ul style="list-style-type: none"> • 57% - Financing Opportunities • 35% - Limited Highly Skilled Workers • 35% - Poor Transport Infrastructure • 29% - Limited Digital Infrastructure 																				
	Examples of Good Practice																				
14.	Bristol is the UK’s biggest digital hub outside of London and has the most productive local tech ecosystem as shown in Figure 2. ⁹ Bristol also came first in the 2017 Huawei UK Smart Cities Index 2017 and was the world’s first ‘open’ city. ¹⁰																				

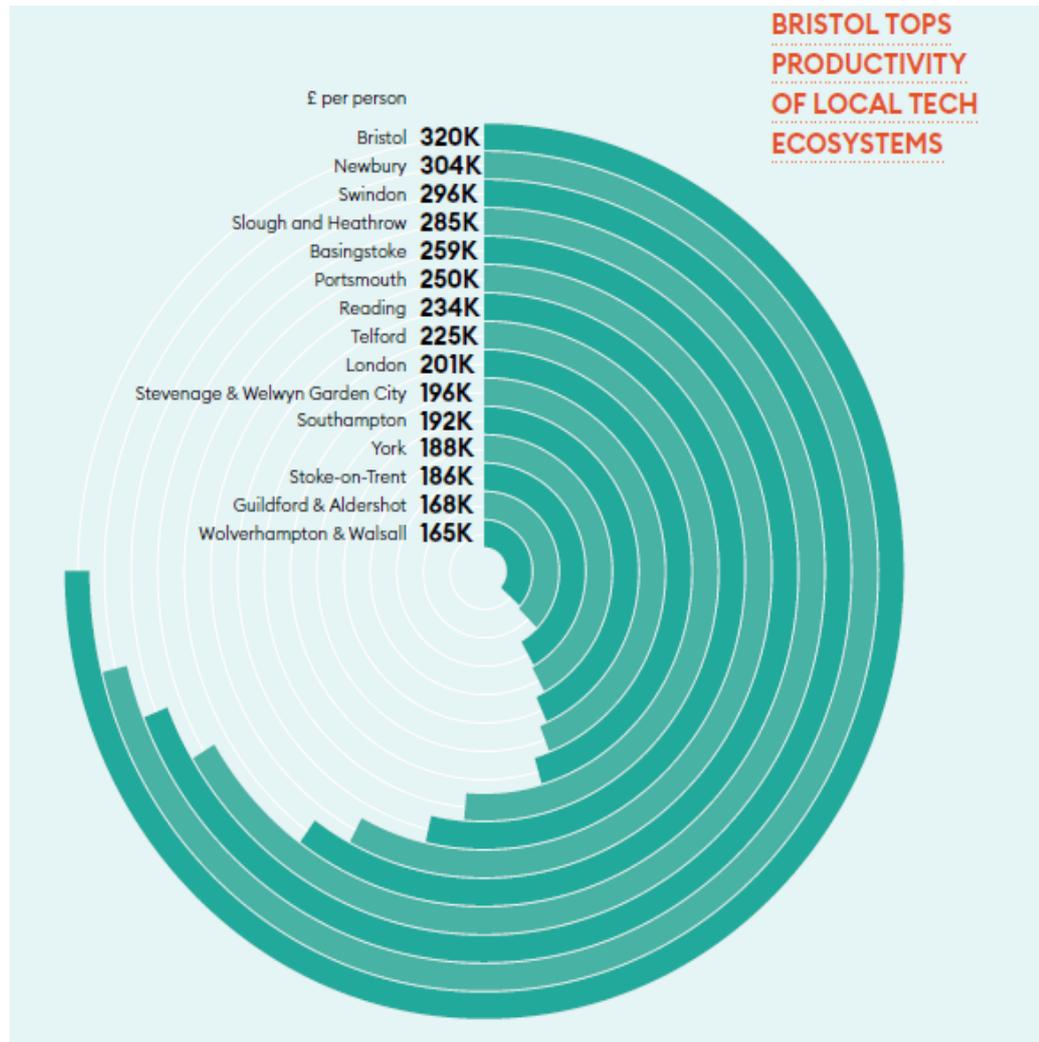
⁸ Tech Nation Report 2017, Tech City UK, p103

⁹ ONS Business Structure Database, 2017, referenced in Tech Nation 2018 report p25

¹⁰ Huawei UK Smart Cities Index 2017

15. Attached as Appendix 1 is a report published by the European Commission in January 2017 that highlights the actions that have been taken in the Bristol City Region to transform the digital landscape of the area. The report identifies key roles played by local government, businesses and business incubators, universities and the Chamber of Commerce.

Figure 2 – Productivity (£ per person), turnover by employee for the top 15 UK travel to work areas



Source: ONS Business Structure Database, 2017, referenced in Tech Nation 2018

16. To consider the issues identified in the previous paragraphs, and to provide the Panel with insight on the initiatives, plans and activity that will help Southampton benefit from the rapidly expanding technology sector and become a centre for AI, robotics, smart automation, and the digital economy, a number of guests have been invited to the inquiry meeting:

- Catherine Lee – Director of Research, Innovation & Enterprise, Southampton Solent University
- David Bream - Director, Southampton SETsquared, University of Southampton
- Denise Edghill - Interim Director for Growth, Southampton City Council. Denise has a wide portfolio of responsibilities including

	<p>economic development, employment skills and business engagement, regeneration, infrastructure and planning and cultural services.</p> <ul style="list-style-type: none"> • Jeff Walters – Economic Development Manager, Southampton City Council • Tech UK – Representatives from the trade association representing UK technology companies have been invited to attend the meeting
17.	The guests invited to present information at the meeting will take questions from the Panel relating to the evidence provided. Copies of any presentations will be made available to the Panel.
RESOURCE IMPLICATIONS	
<u>Capital/Revenue</u>	
18.	N/A
<u>Property/Other</u>	
19.	N/A
LEGAL IMPLICATIONS	
<u>Statutory power to undertake proposals in the report:</u>	
20.	The duty to undertake overview and scrutiny is set out in Part 1A Section 9 of the Local Government Act 2000.
<u>Other Legal Implications:</u>	
21.	None
RISK MANAGEMENT IMPLICATIONS	
22.	None
POLICY FRAMEWORK IMPLICATIONS	
23.	None
KEY DECISION	No
WARDS/COMMUNITIES AFFECTED:	None directly as a result of this report
<u>SUPPORTING DOCUMENTATION</u>	
Appendices	
1.	Bristol: The World's First Open City, January 2017
Documents In Members' Rooms	
1.	None
Equality Impact Assessment	
Do the implications/subject of the report require an Equality and Safety Impact Assessments (ESIA) to be carried out?	No
Data Protection Impact Assessment	
Do the implications/subject of the report require a Data Protection Impact Assessment (DPIA) to be carried out?	No

Other Background Documents: Equality Impact Assessment and Other Background documents available for inspection at:

Title of Background Paper(s)	Relevant Paragraph of the Access to Information Procedure Rules / Schedule 12A allowing document to be Exempt/Confidential (if applicable)
1.	Tech Nation 2018 Report - https://technation.io/insights/report-2018/
2.	Tech Nation 2017 Report – https://35z8e83m1ih83drye280o9d1-wpengine.netdna-ssl.com/wp-content/uploads/2018/04/Tech_City_2017_report_full_web.pdf
3.	CBRE report: ‘ <i>EMEA Tech Cities: Opportunities in Technology Hotspots</i> ’ - https://www.cbre.co.uk/research-and-reports/EMEA-Tech-Cities--Opportunities-In-Technology-Hotspots
4.	Creative Network South: Solent Creatives Industries Declaration - http://www.creativenetworksouth.co.uk/wp-content/uploads/2018/10/HANTSCC8605-Creative-industires-Brochure_v16-SINGLES-DIGITAL.pdf
5.	Huawei UK Smart Cities Index 2017 – https://e.huawei.com/uk/marketing-material/onLineView?MaterialID={A81CFA81-C7A8-4E8F-A088-963C7E73F3CC}

This page is intentionally left blank



Digital Transformation Monitor

Bristol: the world's first open city

January 2017





Bristol: the world's first open city

Bristol is the biggest digital hub outside of London, attracting industries in high-tech, clean tech, digital and creative industries. The city is seen as a “testbed” for the Internet of Things and is the world’s first open, programmable city region. Its award-winning approach is based on learning from the best examples, sharing own experiences and constantly looking for innovative ways to operate. Besides leadership from the top, the city’s digital transformation closely relies on the entrepreneurial attitude and the cooperative efforts of its local champions.

1

Problem statement

Bristol as a digital pioneer

Bristol has long been at the forefront of digital transformation. This position stemmed from the realisation that the services provided by the council to the citizens were based on old-fashioned and suboptimal technologies.

Local stakeholders acknowledged the potential of the use of digital technologies and of the Internet of Things to improve the lives of Bristol residents.

Rethinking digital infrastructures

This new perspective led the council to rethink the city’s digital infrastructures in order to focus on the identification of new and innovative ways to enable citizens to interact with the council and to benefit from public services.

Putting citizens at the centre of Bristol’s digital strategy

Citizens lie at the core of Bristol’s approach towards transformation. In order to make the city smarter and more tailored to the needs of the citizens, the city council has recognized the need to encourage Bristolians to make (greater) use of public open data.

Bristolians have therefore developed new products and services, contributing to the creation of a more “liveable” and creative digital city.

The ultimate goal is to tackle pressing urban challenges by adopting an engaging, innovative and playful approach.

The development of digital infrastructures paving the way for Bristol to become a creative hub

This emphasis on digital transformation is enabled by the presence of successful businesses, state-of-the-art digital infrastructures and support from city leaders. Together, these components allow the Bristol and Bath region to pave the way towards the growth of the UK’s creative industries and for the generation of an international example of a creative hub.

In particular, the collaborative approach between universities, chambers of commerce and incubators, as well as strong public-private partnerships, ensure the success of the city as a “testbed” for digital innovation.

“Bristol has always been a distinctive smart city because we place citizens at the heart of our strategy and take a playful and engaging approach to tackling serious urban challenges.” – Stephen Hilton, Director of Bristol City Council’s Bristol Futures team¹

Consequently, Bristol has attracted major international corporations, and boasts the highest retention rate of university graduates.

Bristol as a leading UK Smart City

This strategy is paying off and is setting an approach that other cities are keen to learn from. Indeed, the Huawei UK Smart Cities Index places Bristol among the top ten cities in the country.²

The index highlights five themes that are common across most of the successful smart city programmes, namely³:

- importance of leadership and vision;
- need to focus on local priorities and strengths;
- importance of engagement with local communities;
- building local partnerships; and
- understanding the way in which the data revolution can improve services and boost innovation.



According to these criteria, Bristol is ranked as a leader alongside London, having obtained the second-highest scores in terms of Strategy (81.9) and Strategy execution (78.4).

Indeed, Bristol's smart city strategy provides a framework to connect successful innovations with priority issues for the city and its communities.

Figure 1: Top 5 Smart cities in UK

	City	Category
1	London	Leader
2	Bristol	Leader
3	Birmingham	Contender
4	Glasgow	Contender
5	Manchester	Contender

Source: Huawei UK Smart Cities Index²

2

Realised benefits and new opportunities

Monetary and social impact indicators assessing digital strategy's success

Bristol's success can be measured in two ways. Firstly, a monetary perspective can be taken, for instance by analyzing the investments of large multinational companies.

On the other hand, the success can be measured in terms of the social impact of digitalisation, looking at indicators such as the creation of skills, confidence and employment, particularly in more deprived areas.

In the following, both the monetary as well as the social impact perspective will be taken to assess Bristol's success.

Monetary Perspective: Increasing the value of the digital sector

From a monetary perspective, the digitalisation of the city has resulted in an increase of the digital sector's value and of its importance in the national economy.

According to a recent study by McKinsey, Bristol's ICT cluster is 'the most significant and fastest growing outside of London'. Indeed, the Bristol City region ICT sector is worth £1 billion to the Gross Value Added (GVA) of the UK⁴.

Moreover, 91.3% of Bristol adults used the Internet over the past 3 months according to the Office of National Statistics. This figure is significantly higher than the UK average of 86%.

Knowle West Media Centre, 2014-2015⁵



- Work placements to **23** young people
- Internships/apprenticeships to **14** young people
- **5** additional full time jobs created
- **8** new businesses set up and developed

Social impact dimension: boosting skills and jobs

Bristol prides itself on the social dimension of its digital transformation. It relies largely on the use of creativity, media and digital technologies to inspire people, particularly the younger generations.

At the same time, this approach solves societal issues in the most deprived neighbourhoods.

Knowle West Media Centre ensures an inclusive digitalization process

In this respect, the work of organisations such as the Knowle West Media Centre (KWMC) has been extremely beneficial in reaching out and engaging with the most vulnerable communities. In doing so, the city ensured that everyone can benefit from the digitalisation process⁵.

Indeed, the KWMC is positively contributing to achieving social, environmental and economic regeneration by involving the community in media activity, education and action.

KWMC achieves this by providing training courses to develop skills in digital manufacturing equipment and technologies.

Council process times has dramatically reduced from **10 days** to less than **1 day**

Figure 2: Knowle West Media Centre



Source: Knowle West Media Centre

Bristol's incubators are fostering social entrepreneurship

Social entrepreneurship is also an important element in the activities of Bristol's many incubators. One example is the Bristol SETsquared Centre.

Indeed, the incubator seeks to bring about economic development and social benefits to the community.

For instance, the SETsquared helped to develop Oracles's small local office into a major centre for client support, creating new jobs, attracting more investments and contributing to the social dimension of digitalisation.

Redesigning and digitising public services tailored to changing needs

The Bristol City Council Digital Platform project was conceived as part of a wider transformation programme within the Bristol City Council in order to improve the way services are delivered.

This process took into account a landscape of budget cuts and the increasing and changing demand for user-friendly services⁶. Thus, over the past few years, the council has been redesigning and implementing numerous new digital services for its citizens.

For instance, in 2015, 11 new services were delivered, including taxi licensing, parking permits, pest control and concessionary travel. These new services have been built to use digital technologies and data from end-to-end. Thus, all procedures related to the various council applications which were previously done manually could now be digitised.

For instance, a regular traditional council application process used to take about 10 days, whereas now the digitally redesigned application process can be done in 1 day only. The digital transformation of these public services therefore brought about efficiency gains which contributed to the creation of more "user-friendly" public services.

Open data is benefitting citizens on various dimensions

Being a leading 'open' and 'programmable' city allows Bristol to create new ways in which open data is used for the benefit of society.

Bristol works extensively to revolutionise health monitoring

Open data and smart sensors can be a powerful tool to tackle healthcare issues and monitor well-being in a non-invasive and stress-free way.

In this context, new research projects have been launched in Bristol to generate knowledge and data that will change clinical practice by focusing on real-world technologies.

Bristol's enabling and creative environment has the potential to embed healthcare technologies into people's everyday life, allowing their development through early and sustained user involvement. A case in point for such opportunity is the SPHERE project (see Key Initiatives).



Bristol created necessary conditions to become a "green leader"

New technologies, innovation, open data and partnerships between local champions will provide the opportunity to make Bristol a leading "green" and smart energy city in the near future. Indeed, through the Bristol is Open initiative, it will be possible to reduce carbon emissions by 40% by 2020 and create 95,000 new jobs⁷.

Particularly high growth sectors such as the creative industries and green technologies are affected by the vision of having Bristol recognised among the top 20 European cities by 2020.

Centrally coordinating supply of heat and power across the city

Moreover, by 2020, Bristol will have a public-interest organisation which coordinates the smart use, distribution and supply of heat and power across the city for the benefit of its people and businesses⁸.

The city will have the capabilities and systems to access, manage and interpret local energy supply and demand data. This will enable coordinated city and neighbourhood-scale interventions to balance heat and power demand and supply across the city in real time; to curb energy waste and reduce peak demand; to reduce network losses and to manage system constraints effectively.

3

Drivers and obstacles

A

Drivers

"Smart City" status reached thanks to strong framework conditions

Achieving the status of a leading smart city has been made possible by a series of drivers, which have provided the appropriate conditions and prerequisites for the development of the digital strategy of the city of Bristol.

Support from the Bristol City Council for high-speed broadband access

The creation of a smart city of the future relies on access to extra fast broadband. Thus, in order to turn the city into a high-tech "testbed" for innovation, a 30 Gigabit per second fiber broadband network has been installed in the city. It serves as the basis for a wide range of digitalization projects.

Bristol City Council created 3 improvements to high-speed internet

The Bristol City Council (BCC) has acted in three ways to improve access to high-speed internet.

1. Broadband Voucher Scheme covers cost of connecting to high-speed internet

The BCC has intervened directly by putting in place a series of measures such as the Broadband Voucher Scheme⁹.

This scheme granted 1,685 Bristolian Small and Medium-sized Enterprises (SMEs) a Government-funded voucher to cover the cost of connecting to high-speed broadband. The scheme, which was open until October 2015, provided support to the businesses for a total value of £2,597,006.

2. Fostering supply and competition in broadband access

Secondly, the BCC made a series of tactical interventions to increase the supply of and competition in broadband access. For instance, in late 2015, BCC agreed a concession to a consortium of two alternative network Internet Service Providers (ISPs) in a 20 year deal¹⁰.

The consortium (BNET Ultra Ltd) will manage and maintain The Bristol Network duct network and could bring back into use the 60km of “unused duct”.

The consortium, thus, utilises spare capacity in the network to offer new super and ultra-fast broadband services to Bristol’s businesses and, at the same time, will generate a multi-million revenue stream to help the BCC deliver better council services.

3. Supporting investment in R&D

Thirdly, Bristol City Council is also supporting investment in Research and Development to stimulate the High Tech sector. For instance, the BCC has made a £7million “Gigabit Bristol” investment in fibre and wireless mesh networks to support High Tech research and development at the city scale.

This programme has the goal to accelerate Bristol’s position in relation to the Internet of Things, Big Data Analytics and High Technologies.

European Commission as the provider of financial support

Bristol’s digitalisation and smart city strategy also entails an important degree of involvement from the side of the European Commission.

Indeed, the Commission’s financial support plays a key role in this respect. EU-funded programmes, after all, are an important pillar of the city’s innovation agenda.

REPLICATE: an EU programme integrating Smart Energy and Smart Transport innovation

A prime example of the EU contribution to Bristol’s innovation agenda is REPLICATE which stands for “Renaissance in Places with Innovative Citizenship And Technology”¹¹.

It is a European 5-year research and development Smart City ‘Lighthouse’ project that aims to deploy integrated energy, mobility and ICT solutions in city districts.

The project was launched in February 2016. The city of Bristol, as part of a consortium with San Sebastián (Spain) and Florence (Italy), has been awarded €25 million to create integrated smart city solutions to tackle urban problems.

In particular, the programme covers the Ashley, Easton and Lawrence Hill Neighbourhood Partnership area, chosen as the target district to explore the impact of integrating Smart Energy and Smart Transport inventions.



Key stakeholders

The key component that makes Bristol a leading example of a smart city is the collaborative approach between a variety of stakeholders.

In fact, this collaboration is composed of stakeholders from both the public and private spheres, including universities, chambers of commerce and incubators, as well as strong public-private partnerships.

Some of the main actors that are actively involved in the digital scene of the city are listed in the table below.

Figure 1: Public and private actors fuelling Bristol’s digital transformation

Public	Private
-Bristol City Council	- NEC
-Bath and North East Somerset Council	- InterDigital
-University of Bristol	- Mellanox Technologies
-University of Brunel	- Polatis
-University of West England	- Laser 2000
-Bath SPA University	- DELL
-Incubators (SETsquared)	
-Engine Shed	
-Knowle West Media Centre	

Source: PwC Analysis

Key initiatives

“Bristol is Open” makes open data available to all interested parties

Announced in 2015, “Bristol Is Open” is Bristol’s flagship initiative, aiming to concretise and make open data a reality¹². It is a joint venture between the University of Bristol and the Bristol City Council. The initiative is funded at local, national and EU levels as well as with academic research funding and by the private sector.

The project delivers R&D to equip the city with the latest small sensors. This includes the smartphones and GPS devices of interested participants, which will supply the three new 30 Gb/second fibre broadband networks with a wide range of information about city life (e.g. air quality, energy and traffic flows).

This will allow to understand how big data can be used to solve issues such as air pollution and traffic congestions. Thus, the initiative will ultimately contribute to the development of new applications leveraging on the "Internet of Things" in the city.

Plans to extend the initiative are already underway

Once the new networks are established in the city centre, over the next 3 years they will be extended to the wider city region, i.e. Bath, parts of North Somerset and South Gloucestershire.

These networks are for research and development projects, as opposed to providing free or commercial broadband or wifi. Nevertheless, the public will have the opportunity to join the experimental initiatives, should they wish to do so.

Open data will create countless creative and useful opportunities

All the data generated will be anonymised and made public through an 'open data' portal. The creative content flowing through the high-speed network can be used in a variety of playful ways to foster 'digital inclusion', for instance projecting 3D images into the sky or holding a music concert across multiple venues in the city at the same time.

"The joint venture created between Bristol City Council and the University of Bristol, and the engagement of industry is proving to be a dynamic way to push our 'programmable city' activity forward." –

Paul Wilson, Managing Director of Bristol Is Open¹³

SPHERE¹⁴

SPHERE (Sensor Platform for HEalthcare in a Residential Environment) is a project involving nearly 100 researchers, designed to employ new technology to address long-term health issues. These include obesity, depression, diabetes, strokes, respiratory conditions, cardiovascular and musculoskeletal disease.

SPHERE has developed a number of different sensors allowing the monitoring of health and well-being at home. This information can then be used to spot issues that might indicate a medical or well-being problem.

To make his happen, clinicians, engineers, designers and social care professionals as well as members of the public are collaborating to develop these sensor technologies. The project was awarded a £12 million grant by the Engineering and Physical Sciences Research Council (EPSRC).



Key infrastructures

Bristol boasts a dynamic and vibrant ecosystem of both public and private actors that drive the scene for the digital transformation. In addition to the many public institutions (local councils, universities, research centres, etc.), the city has a thriving start-up community, enabled by its infrastructures that foster knowledge sharing, networking and testing of new ideas.

The Bristol SETsquared Centre¹⁵

The Bristol SETsquared Centre is the Business Accelerator of the University of Bristol, providing a variety of services to early-stage companies and start-ups.

These include coaching, mentoring, workshops, business review panels, access to professional service firms and services, access to SETsquared's global network, investor readiness training, investor showcase events, access to the new Bristol is Open experimental network, and use of the Engine Shed Business Lounge.

Moreover, office space with desk-stations, reception services and meeting rooms can be provided where required.

The Centre holds many regular networking events, such as the SETsquared Garden Party and Innovation Showcase, where investors, corporates, grant-funders and potential non-executive directors get together to see the technology businesses supported by the Centre.

In November 2015, SETsquared won the top accolade of Global Number 1 University Business Incubator, awarded by UBI Global.

The Bristol SETsquared Centre has also won the prestigious Established Business Incubator of the Year 2012 and Best Designed Business Incubator 2013 award from the industry trade body, UKBI.



B

Obstacles

Despite the remarkable level of digitalisation achieved by the city and its companies, some challenges still remain. These are related both to the availability of resources and coordination of players, but also to the socio-economic context in the city.

Insufficient capacity impedes extension of digitalisation initiatives

Bristol boasts excellent facilities and infrastructure to drive its digitalisation and that of its businesses. Nevertheless, according to the former mayor George Ferguson, the success of the digitalisation initiatives was underestimated, resulting in the fact that further progress is constrained by the limited resources, capacity and infrastructure.

A need for further collaboration among local authorities needed

The digital transformation process relies on the development of strong partnerships and effective and smooth communication between all the key stakeholders involved. In this respect, the former mayor of Bristol believes that more and better cohesion is required between the four local authorities in the greater region.

Enhancing social equality as a means to accelerate the digital transformation process

Bristol is a prosperous city, both nationally and internationally. Nevertheless, important disparities still persist among the population, thus constituting a potential hindrance to the full reach of the digital transformation process.

Indeed, there are significant health and wellbeing inequalities, resulting in a 8.9 year difference in life expectancy between least and most deprived areas. Similarly, there are gaps in educational attainment with only 35% of children achieving GCSEs in some areas¹⁶.

4

Lessons learnt

The lessons learned from Bristol's case can serve as useful guidelines for the development of a connected pan-European network of cities and the creation of launchpads for digital transformation.

The importance of collaboration

The successful digital transformation of cities relies on close cooperation between the relevant actors. In this respect, establishing strong public-private partnerships is fundamental.

The practical collaboration between local authorities, universities, large companies and start-ups allows ideas and views from all actors to come together and become concretised into a winning initiative. The Bristol is Open initiative is a case in point for this concept.



Establishing strong networks is essential

The creation of an enabling and conducive environment for sharing and testing of ideas is the primary requirement for successful collaboration between actors. Indeed, physical cooperation is key in this respect.

Therefore, establishing centres where innovative start-ups, large companies and investors can physically meet and exchange ideas has proved to be essential.

Successful examples include the Engine Shed, Watershed and SETsquared, which provide a nurturing environment for entrepreneurs and ensure that they do not act in isolation.

Digitalisation has the power to bring about social change

Technology, innovation and digitalisation should be seen as a powerful tool to bring about economic development, to level out disparities and to ensure the participation and involvement of the entire population in the digital transformation process.

Ultimately, digitalisation gives entrepreneurs the opportunity to shape the environment of their city, helping it to overcome inequalities and improving the quality of life of the population.

Risk taking and financial support are needed to succeed in digitalisation

The attitude of the city and its actors is also a factor that determines the success of digitalisation. The lesson that can be learnt from Bristol's case is the importance of fostering an open and trusting approach, mitigating risk aversion and creating a feeling of trust among investors and companies alike.

Indeed, Bristol boast excellent financial support opportunities, owing to the open support of the Bristol City Council, local investors but also at the European level.

Connectivity infrastructure bears strategic importance

Naturally, the digital transformation of cities cannot take place without the appropriate enabling infrastructure.

In particular, Bristol's case has highlighted the strategic importance of super high-speed broadband, allowing to achieve exceptional levels of connectivity and generate meaningful volumes of data that can then be used to solve societal challenges.

Data privacy should be everyone's concern, including citizens

Of course, open data implies some data privacy considerations. Indeed, privacy can lead to heated debate and cities should help shape this debate, rather than leaving it to technology companies.

5

Key Recommendations

Based on the case of Bristol, the importance of the roles of local players has emerged. Thus, several recommendations can be formulated, detailing the actions and responsibilities of each group of stakeholders, so as to ensure that the digitalisation process is successful in the long run.

These recommendations are illustrated in the table, and can serve as best practices for other cities starting down the digital transformation path.

Category	Role of the stakeholder
Local government 	<ul style="list-style-type: none"> - Drive political leadership and vision as to where to drive the city - Bring about more cohesion between different public authorities towards a common objective - Set targets to measure success (e.g. on the basis of jobs created) - Stimulate innovation(e.g. through fiscal measures, tax reductions, etc).
Businesses and Incubators 	<ul style="list-style-type: none"> - Share experience and act as advisors to budding start-ups - Keep providing inspiration, support, stimulation
Universities 	<ul style="list-style-type: none"> - Be open and ready to form joint ventures (e.g. SETsquared) - Provide digital entrepreneurial skills and curricula
Chamber of Commerce 	<ul style="list-style-type: none"> - Get involved in the support of peer to peer learning and in the education of traditional businesses

References

¹ University of Bristol, "Bristol named as leading UK Smart City", 2016, available at: <http://www.bristol.ac.uk/news/2016/may/bristol-smart-city.html>

² Huawei, "UK Smart Cities Index – Assessment of Strategy and Execution of the UK's Leading Smart Cities", 2016, available at: https://www.huawei.eu/sites/default/files/Huawei_UK_Smart_Cities_Report.pdf

³ Steven McGinty, "Bristol is Open: Case Study of an Innovative Smart City, 2016, available at: <https://blog.idoxgroup.com/2016/09/07/bristol-is-open-case-study-of-an-innovative-smart-city/>

⁴ Jamie Middleton, "Bristol and Bath labelled the fastest growing hi-tech region outside London", 2014, available at: <http://techspark.co/bristol-and-bath-labelled-the-fastest-growing-hi-tech-region-outside-london/>

⁵ Knowle West Media Centre, <https://issuu.com/knowlewestmedia>

⁶ Digirati, "Enabling Channel Shift for Local Government, available at: <http://digirati.com/case-studies/bristol-city-council-digital-platform/>

⁷ Steven McGinty, "Bristol is Open: Case Study of an Innovative Smart City, 2016, available at: <https://blog.idoxgroup.com/2016/09/07/bristol-is-open-case-study-of-an-innovative-smart-city/>

⁸ Centre for Sustainable Energy, "Bristol Smart Energy City Collaboration"; 2015, available at: <https://www.cse.org.uk/projects/view/1296>

⁹ Broadband Delivery UK, <http://www.connectionvouchers.co.uk/city/bristol/>

¹⁰ Mark Jackson, "Bristol City Commercialises Ultrafast BNET Fibre Optic Network", 2015, available at: <http://www.ispreview.co.uk/index.php/2015/10/bristol-city-commercialises-its-ultrafast-bnet-fibre-optic-network.html>

¹¹ EC, "REPLICATE – Renaissance of Places with Innovative Citizenship and Technology", available at: <https://ec.europa.eu/inea/en/horizon-2020/projects/replicate>

¹² Bristol is Open, <http://www.bristolisopen.com/>

¹³ Bristol is Open, "Bristol Is Open wins Smart City Innovator Award, 2016, available at: <http://www.bristolisopen.com/bristol-is-open-wins-smart-city-innovator-award/>

¹⁴ SPHERE - a Sensor Platform for Healthcare in a Residential Environment, <http://www.irc-sphere.ac.uk/about>

¹⁵ SETsquared in Bristol, <http://www.setsquared.co.uk/start-support/innovation-centres/setsquared-bristol>

¹⁶ BBC, "Bristol mayor tackles life expectancy 'gap'", 2013, available at: <http://www.bbc.com/news/uk-england-bristol-23497196>

References

- ¹ University of Bristol, "Bristol named as leading UK Smart City", 2016, available at: <http://www.bristol.ac.uk/news/2016/may/bristol-smart-city.html>
- ² Huawei, "UK Smart Cities Index – Assessment of Strategy and Execution of the UK's Leading Smart Cities", 2016, available at: https://www.huawei.eu/sites/default/files/Huawei_UK_Smart_Cities_Report.pdf
- ³ Steven McGinty, "Bristol is Open: Case Study of an Innovative Smart City, 2016, available at: <https://blog.idoxgroup.com/2016/09/07/bristol-is-open-case-study-of-an-innovative-smart-city/>
- ⁴ Jamie Middleton, "Bristol and Bath labelled the fastest growing hi-tech region outside London", 2014, available at: <http://techspark.co/bristol-and-bath-labelled-the-fastest-growing-hi-tech-region-outside-london/>
- ⁵ Knowle West Media Centre, <https://issuu.com/knowlewestmedia>
- ⁶ Digirati, "Enabling Channel Shift for Local Government, available at: <http://digirati.com/case-studies/bristol-city-council-digital-platform/>
- ⁷ Steven McGinty, "Bristol is Open: Case Study of an Innovative Smart City, 2016, available at: <https://blog.idoxgroup.com/2016/09/07/bristol-is-open-case-study-of-an-innovative-smart-city/>
- ⁸ Centre for Sustainable Energy, "Bristol Smart Energy City Collaboration"; 2015, available at: <https://www.cse.org.uk/projects/view/1296>
- ⁹ Broadband Delivery UK, <http://www.connectionvouchers.co.uk/city/bristol/>
- ¹⁰ Mark Jackson, "Bristol City Commercialises Ultrafast BNET Fibre Optic Network", 2015, available at: <http://www.ispreview.co.uk/index.php/2015/10/bristol-city-commercialises-its-ultrafast-bnet-fibre-optic-network.html>
- ¹¹ EC, "REPLICATE – Renaissance of Places with Innovative Citizenship and Technology", available at: <https://ec.europa.eu/inea/en/horizon-2020/projects/replicate>
- ¹² Bristol is Open, <http://www.bristolisopen.com/>
- ¹³ Bristol is Open, "Bristol Is Open wins Smart City Innovator Award, 2016, available at: <http://www.bristolisopen.com/bristol-is-open-wins-smart-city-innovator-award/>
- ¹⁴ SPHERE - a Sensor Platform for Healthcare in a Residential Environment, <http://www.irc-sphere.ac.uk/about>
- ¹⁵ SETSquared in Bristol, <http://www.setsquared.co.uk/start-support/innovation-centres/setsquared-bristol>
- ¹⁶ BBC, "Bristol mayor tackles life expectancy 'gap'", 2013, available at: <http://www.bbc.com/news/uk-england-bristol-23497196>

About the Digital Transformation Monitor

The Digital Transformation Monitor aims to foster the knowledge base on the state of play and evolution of digital transformation in Europe. The site provides a monitoring mechanism to examine key trends in digital transformation. It offers a unique insight into statistics and initiatives to support digital transformation, as well as reports on key industrial and technological opportunities, challenges and policy initiatives related to digital transformation.

Web page: <https://ec.europa.eu/growth/tools-databases/dem/>

This report was prepared for the European Commission, Directorate-General Internal Market, Industry, Entrepreneurship and SMEs; Directorate F: Innovation and Advanced Manufacturing; Unit F/3 KETs, Digital Manufacturing and Interoperability by the consortium composed of PwC, CARSA, IDATE and ESN, under the contract Digital Entrepreneurship Monitor (EASME/COSME/2014/004)

Authors: Laurent Probst, Bertrand Pedersen, Olivia-Kelly Lonkeu & Federica Amato, PwC

DISCLAIMER – The information and views set out in this publication are those of the author(s) and should not be considered as the official opinions or statements of the European Commission. The Commission does not guarantee the accuracy of the data included in this publication. Neither the Commission nor any person acting on the Commission's behalf may be held responsible for the use which might be made of the information contained in this publication. © 2017 – European Union. All rights reserved.