TechTown State of the Art

A Digital City Future - Adapt or Die

Alison Partridge, November 2015

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1. INTRODUCTION

1.1. TechTown

TechTown is an URBACT III Action Planning Network of 11 cities which aims to explore how small and medium sized cities can maximise the job creation potential of the digital economy. During the period from September 2015 to May 2018 it will examine whether there is potential for spillover from stronger city and regional level digital economies, explore the role of the city in growing a digital economy, examine how clusters can work at city level and look collaboratively at what cities can do to support businesses to access the digital skills and innovations they need in order to start, grow and compete.

More specifically it will focus on the following themes:

Better understanding the digital economy

In order to address the questions set out above, and in recognition of the fact that 'if you can't measure it, you can't improve it', TechTown will need to better understand the digital economy and its potential value. Cities will explore together how to do this in such a fast moving context. How can cities identify their digital community? How do others define 'digital jobs' and is it helpful to pin down a precise definition? What tools already exist which can help to measure existing and future growth potential? What new metrics will be needed to measure city interventions? Is there scope to develop a tool for TechTown cities to help with this?

Growing Digital Jobs

TechTown will look into how cities can grow digital jobs. This will be covered through the following 4 sub themes:

- **Growing new digital jobs through start ups**: What can cities do to support digital start ups? How can they better position themselves to optimise the conditions for competitiveness? What sort of business support do digital start ups want and need? How can cities help start ups to survive and to grow?
- **Growing jobs through the digital transformation of traditional industry**: What can cities do to support digital transformation of traditional industry and existing businesses? What is the role of cluster policy? (How can cities help small family (retail) businesses?)
- **Growing digital jobs through the smart city agenda:** How can cities ensure that they maximise the local jobs creation potential linked to delivering smart city agendas? How can they avoid larger multinationals reaping all the rewards? What role could local city

challenges, hackathons play? What role could public procurement play?

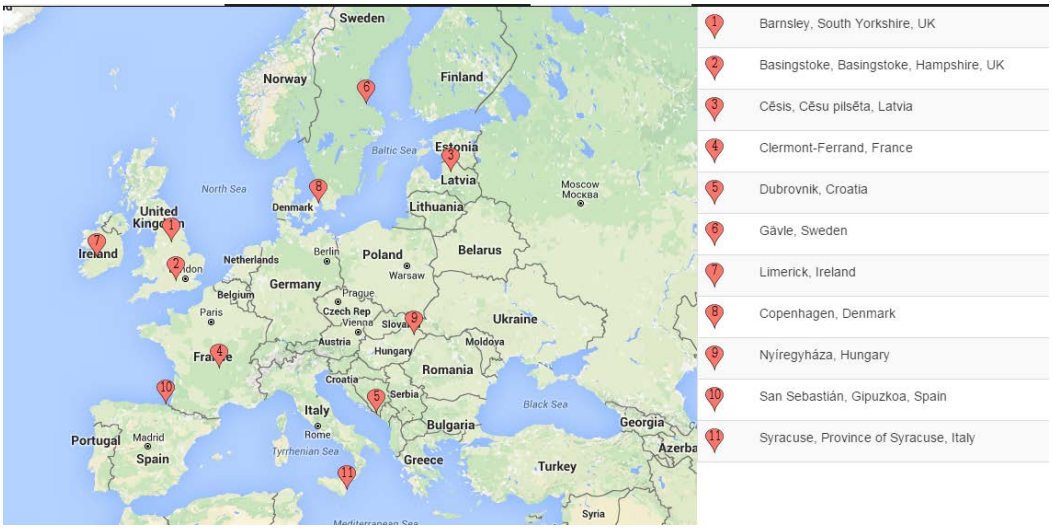
- **Providing spaces and places for connections:** How important is it to have a physical space for the digital community? What does this space look like? What is the accompanying 'offer' in terms of business support, incubator or accelerator support? What is the unique position of medium sized cities?

Finding, growing, retaining and returning talent: How can medium sized cities attract and retain (young) skilled people? How can they position themselves so that people want to live and work there? What can cities do to better match education and training provision with the needs of the digital economy (now and in the future)? How can they avoid losing out to larger regional and national 'hubs'?

Governance: One cross cutting key issue to be addressed will be the capacity of cities and their stakeholders to rise to the new challenges of the digital economy. Do they have the right skills and attributes to maximise its potential? Are they the best people to do so for the city? Could others do it better? How can they better engage with other stakeholders? What new governance arrangements should be considered? How can cities be as responsive and nimble as the digital economy whilst maintaining resilience?

The partners will use the learning generated through transnational activities to inform their local actions.

Figure 1 - Map of TechTown cities



1.2. State of the Art

In the URBACT programme each network is expected to produce a standalone 'State of the Art' which comprises a literature review, reflections on relevant policies, projects and practices and an assessment of where the network can best add value. This provides an opportunity for networks to start their work with a sound underpinning of knowledge and understanding of the state of play in other European cities.

2. STATE OF THE ART

2.1. The Digital Economy - an introduction

"The digital economy is everywhere; it has transformed and will continue to transform the economy, in terms of productivity and connectivity, especially for SMEs". (Expert Group on Taxation of the Digital Economy, European Commission, 2013).

The digital economy is the 'single most important driver of innovation, competitiveness and growth'. 1.5m additional jobs could be created in the EU digital economy if it mirrored the performance of the US. It already contributes around 8% of the GDP in the G-20 economies and yet only 2% of EU businesses are said to be taking full advantage of digital opportunities (European Commission, 2015).

Recent developments in ICT including the rapid growth of smart devices, social media and the internet-of-things allow for a new type and level of connectedness and digitally mediated interaction between people. New technologies hold massive potential for manufacturing industries, offering potential (good and bad) to transform entire sectors. These new digital trends are not just about technological innovation. They are radically shifting the business landscape, reshaping the world of work, introducing innovations in business models, developing new networking and knowledge transfer mechanisms, reducing the time to market and widening access to international markets. They are also relevant to the management of cities themselves and in the delivery of public services, which benefit the economy, citizens and the environment.

This section explores the many facets of the digital economy. Drawing on an extensive literature review, it looks at:

- Definitions and characteristics of the digital economy
- Size and growth potential
- Challenges and barriers
- Policy responses at international, national and local levels
- The role of cities

The power to connect digital size, scale and outcome lies with businesses, industry sectors and governments. With smarter investments, digital resources, technologies and assets can have a positive influence on competitiveness and help economies and industries drive greater, more sustainable value. (Accenture, 2016 (for World Economic Forum, Davos, January 2016)

2.1.1. The Digital Economy - definitions and characteristics

The digital economy is a constantly evolving landscape. Defining what it includes is not straightforward. Indeed, because of the widespread diffusion of the digital economy across the wider economy, perhaps it is unhelpful to describe it as a separate entity.

The term 'Digital Economy' was first used in the book 'The Digital Economy: Promise and Peril in the Age of Networked Intelligence' (Tapscott, 1996). This was one of the first books to explore how the Internet would change the way we did business. In the same year, Nicholas Negroponte (1995) used a metaphor of shifting from 'processing atoms to processing bits'. Later, in 'Measuring the Digital Economy' Mesenbourg, (2001) identified the three main components of the 'Digital Economy' concept as:

- supporting infrastructure (hardware, software, telecoms, networks, etc.),
- e-business (how business is conducted, any process that an organisation conducts over computer-mediated networks),
- e-commerce (transfer of goods, for example when a book is sold online).

However, new applications are blurring these boundaries and adding complexity and, according to the OECD Digital Economy Outlook (2015), the digital economy 'now permeates countless aspects of the world economy, impacting sectors as varied as banking, retail, energy, transportation, education, publishing, media or health'.

The European Commission's (2015) work asserts that 'digital enterprises are characterised by a high intensity of utilisation of novel digital technologies (particularly social, big data, mobile and cloud solutions) to improve business operations, invent new business models, sharpen business intelligence, and engage with customers and stakeholders. They create the jobs and growth opportunities of the future'.

A report prepared by Accenture (2016) for the World Economic Forum in Davos in January 2016 stated that 'The digital economy is the share of total economic output derived from a number of broad "digital" inputs. These digital inputs include digital skills, digital equipment (hardware, software and communications equipment) and the intermediate digital goods and services used in production. Such broad measures reflect the foundations of the digital economy'.

Alongside these somewhat broad definitions, the UK's TechNation (2015) report 'Powering the digital economy' helpfully identifies the following 11 key sectors:

1. Advertising and marketing
2. Data management and analytics

3. E-commerce
4. EdTech
5. FinTech
6. Games development and publishing
7. HealthTech
8. Marketplace and lead generation
9. Media and entertainment
10. Software development
11. Telecommunications and networking

All of this demonstrates the enormous diversity of the digital economy and reinforces the case that it is a constantly changing world and one in which it is difficult to differentiate the 'digital economy' from the wider economy. The reality is that the digital economy has spread into every sector, from architecture firms whose activities have become almost entirely digital to machine tool manufacturers who now use huge online data-processing facilities to monitor every aspect of their processes and right through to city halls themselves, which are increasingly using digital tools across public services and their city infrastructure.

Digital innovation has also reached into the heart of design and manufacture with rapid prototyping, personalisation and 3D printing becoming affordable and necessary for competitiveness. The sharing economy, predicated on digital tools and the reach of the social web, has transformed everything from city level transport (via Uber) through to how we holiday (AirBnB).

So whilst an absolute definition may not be possible or useful, what is crystal clear is that the digital economy is here to stay and has unprecedented potential for economic growth across the EU.

2.1.2. The Digital Economy - size and growth potential

Over the last 5 years the development of mobile applications alone has created nearly half a million new jobs in the USA. The digital economy now contributes up to 8% of the GDP of the G20 major economies (€3.2 trillion) (EC, 2014). It is estimated that 1.5m additional jobs could be created in the EU digital economy, if it mirrored the performance of the US. European small businesses grow two to three times faster, and create new jobs, when they embrace digital technologies. New technologies can help small businesses go global from day 1, reaching international markets and accessing talent from overseas.

The report 'Doing business in the digital age' (Deloitte, 2013) states that 'digital technologies are one of the most important sources of growth for national economies. They enable

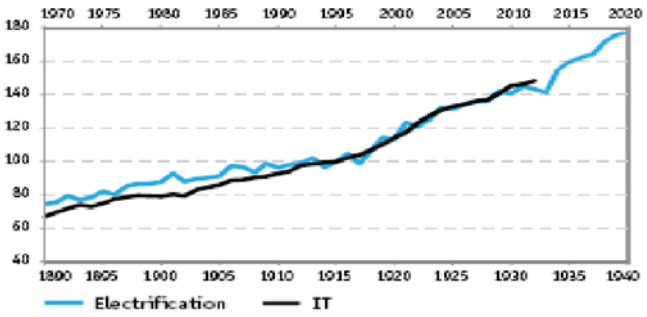
economies to create more jobs, improve people's lives and build better and greener societies. Citizens, enterprises, universities and governments become increasingly connected in the digital world. Digital is changing people's lives: the way they work, shop, socialise, communicate and educate'.

And it is not just about 'new' companies. Digital is also reshaping traditional industries, environments and business models. It speeds up the way new products and services are conceived, developed, produced and accessed.

It is estimated by McKinsey in its report 'Internet Matters: the net's sweeping impact on growth, jobs and prosperity' (McKinsey, 2011) that for every job destroyed by the adoption and use of new technologies, 2.6 new jobs have been created. The same report states that more than 75% of the value created by the internet is found in traditional industries. 'Digital Technologies have become a key driver for economic modernisation and prosperity, eventually leading to higher productivity and growth in all industries and all sectors, both private and public'. McKinsey argues that the internet has accounted for 21% of GDP growth in the past 5 years in developed countries and is a powerful catalyst for job creation. Within the EU, the EU and Sweden are leading the way. In the UK, for example, the recent Small Business Outlook (Centre for Cities, 2015) showed that employment in SMEs in professional services, digital and creative industries increased at over four times the average between 2009 and 2013. Output from the digital sector increased by 657% from 1990 to 2013. These companies are overwhelmingly city based and their presence has been shown to have a knock on effect on the wider economy. Indeed in the US, Moretti (2010) found that for every job created in high tech industries, 5 jobs are created in other industries. So cities with high concentrations of these firms tend to be more productive, more innovative and entrepreneurial and thus have higher job growth. The report prepared for the World Economic Forum in Davos in January 2016 'Digital disruption: The growth multiplier Optimizing digital investments to realize higher productivity and growth' (Accenture, 2016) estimated that 'the digital economy, involving some form of digital skills and digital capital, represents 22.5 percent of the world economy' and went on to state that 'digital's ability to unlock value is far from being fully exploited'.

Syverson (2013) made an interesting analysis of labour productivity growth during the electrification era and the IT era (Figure 2), which showed a bizarrely similar trajectory. If framework conditions are met, this suggests that digitalisation could lead to increases in productivity and innovation and contribute to GDP growth in much the same way as electrification in the 19th and 20th centuries.

Figure 2: Labour productivity Growth during the Electrification Era (1890-1940) and the IT Era (1970-2012) in the United States (1915=100 and 1995=100)



Source: Kendrick (1961); Byrne, Oliner, and Sichel (2013).

Digitalisation also has a massive impact on the way new companies are developed - and thus on entrepreneurship and start up opportunities. These collaboration technologies enable any entrepreneur to access a much larger and diverse talent pool. People can work together across continents and time zones. So individuals can thrive in these new digital business models - giving rise to the growing phenomenon of the 'micro-multinationals'. In a period where large companies and public sector organisations are often shrinking, many people are opting to work for themselves or as part of smaller, more flexible and less hierarchical organisations. In this new world, people will have many careers in different areas. The traditional notion of a 'job' is changing.

The 'App economy' is one example: the report 'The European App Economy: Creating Jobs and Driving Growth (Vision Mobile, 2013) estimates that the European App economy contributes:

- 794,000 jobs across the whole economy;
- 529,000 direct App Economy jobs, 60% of which are developers;
- Revenues of more than 10bn euros per annum;

and that

- 22% of the global production of app-related products and services comes from the EU;

At a more local level, 'The Digital Skin of Cities' (Rabari and Storper, 2013) suggests that the 'smart cities' technology market may be worth anywhere from $100billion to $1 trillion over the next 10 years. The article places cities at the centre of the digital revolution and concludes that city governance and management structures will experience major changes as technologies are predicted to make it possible to manage the physical city in ways not previously possible. Cities can also generate unprecedented quantities of data (big data),

which opens up all sorts of urban governance discussions - and unparalleled job creation opportunities.

2.1.3. The Digital Economy - some challenges and barriers

Despite all of this potential, the growth experienced in some countries - particularly the US - is not mirrored in Europe. According to the European Commission businesses that fail to get digitally connected will become excluded from the global market and yet it is estimated that only 2% of European companies are currently taking full advantage of new digital opportunities.

So what are the challenges and barriers? What is preventing Europe from keeping pace with its global competitors?

The current skills mismatch is a major barrier to growth. It is vital to better integrate digital skills into education from early years to higher education, through vocational training and lifelong learning. As Herman Van Rompuy said in his article Boosting Digital Europe[i] (Digital Minds, European Digital Forum, 2015), 'Unemployment today is about poor skills, not necessarily about poor education'. As more and more 'traditional' jobs are becoming 'digitalised' in some way, so more and more digital skills - from basic ICT skills to more sophisticated coding or programming skills - are needed. Indeed by 2020 it is estimated that 85-90% of all job vacancies in Europe will require digital skills.

'"Digital natives" may be intimately familiar with digital technologies, but Europe must go further: it needs people across all generations to have digital skills. A deep understanding of coding principles and knowledge of a number of programming languages may well become the most important dialect for Europeans of all ages in the digital era'.

'Embracing the digital era to ensure Europe's competitiveness' (European Digital Forum, 2015), Klaus Schwab (Founder and Executive Chairman of the World Economic Forum)

It is ironic that the forces that create a dynamic and entrepreneurial culture are also the ones that create skills shortages, especially as innovation accelerates.

So, Europe also needs to stimulate a more innovative, risk taking and an entrepreneurial mindset and to accelerate the use of digital technologies across old and new businesses. Unless this happens, digital companies will experience difficulties accessing finance and, as they also have often have low levels of working capital, this affects their resilience and ability to build the relationships they need to break into this complex and competitive international market.

At the same time, the cost and speed of protecting intellectual property does not match the speed of technological change. This means that some companies don't put in place the long-term strategies required to survive (such as patent registrations or diversification) but rather focus on short-term gain born out of agility and know-how. Tech companies have a tendency to scale up very rapidly - often before sustainable business structures are in place. But the platforms, systems and supply chains that form the framework within which the digital economy operates need a longer-term approach to investment and innovation, based on broad cross-sectoral collaboration.

Clearly there is no digital economy without digital infrastructure so investment in digital connectivity is required in a market where future revenues are linked to a complex - and often unclear - commercial market. The availability of such infrastructure varies enormously in Europe – and indeed even within individual countries.

Linked to this, there is often unequal access to digital technologies - and digital skills - between affluent (often young, urban) people and more excluded (often older, rural) people - who subsequently become part of the digitally disadvantaged. The counter argument is that digital can help to democratise society, giving many greater access.

Funding - and the regulatory environment in which companies are operating - need to be as agile as the companies themselves. Existing models are often designed around a more 'traditional' innovation context with linear production development processes.

The UK's digital economy strategy (Innovate UK, 2014) also describes barriers linked to what it calls 'tribal boundaries' stating that 'successful digital businesses fuse technical expertise with creative flair and an understanding of their customers. This fusion means erasing the tribal boundaries between 'geeks' and 'luvvies'.

2.2. Policy responses

2.2.1. EU level response

At EU level, the European Digital Agenda is one of the 'flagship initiatives' developed to achieve the EU2020 targets. It concentrates on the digitalisation of business, e-inclusion, start-up support, and help for SMEs that want to digitalise, etc.

The Commission's ambitions in this area are widespread and ultimately aim to ensure that the digital economy delivers sustainable economic and social benefits. The 'Grand Coalition for Digital Jobs' (2015) is particularly relevant in that it aims to help ensure that training is matched to digital jobs by supporting the co-design of training programmes with the ICT industry so that the skills that people get are the skills that business needs. The Coalition's agenda also includes a drive to help people with the right skills to go to the places where

they are most needed so as to avoid shortages - or indeed surpluses - in different places. It its communication 'The Digital Agenda for Europe - Driving European growth digitally' (EC, 2012), the Commission stresses that 'digital skills should be the indispensable component of all professional training, business education and lifelong education programmes to ensure new generations as well as those currently in the workplace are able to acquire the skills they need'.

It also aims to simulate digital entrepreneurship and with Startup Europe is developing a platform of tools and programmes which will support people who want to set up and grow digital companies. The Commission recognises that these start-ups need a more business-friendly environment (a 'license to fail') with 'easier access to finance, markets, networks and skills; which must be encouraged through risk-sharing schemes, venture capital, favourable fiscal treatment and networking events'.

Figure 3 - broad ambitions of the Commission's 'Grand Coalition for Digital Jobs'

Ultimately the Commission's vision is for the EU's economy and society to transform into a digital Europe - where digital technologies, media and content are embraced and exploited by the whole population. 'The explosive growth of the utilisation of ICT in our daily life is contributing more than any other technological innovation to a radical change in the economy and the society as a whole. In the next decade ICT can contribute to a paradigm

shift in society and in production systems, enabling higher growth and welfare through more efficiency, new products, new services and smarter public services'.

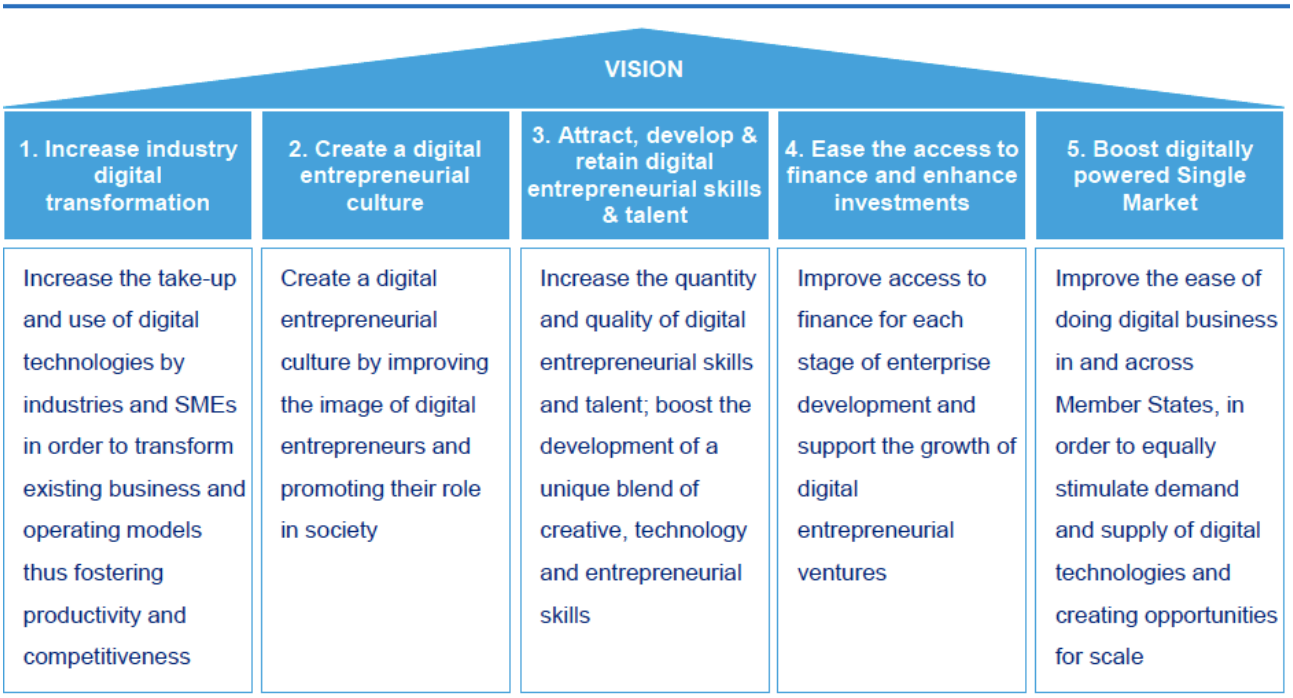
Three priorities have been defined to help achieve this vision:

- 'To become a magnet for highly skilled talent and a distinctive place for doing business, built upon Europe's unique identity.
- To foster a truly entrepreneurial culture to maximise the digital potential of Europe's SME-driven economy.
- To actively support and promote the connection between traditional industries and the digital economy'.

....and these have led to the establishment of 5 complementary objectives:

1. Increase industry digital transformation. Increase the take-up and use of digital technologies by industries and SMEs in order to transform existing business and operating models thus fostering productivity and competitiveness.
2. Create a digital entrepreneurial culture. Improve the image of digital entrepreneurs and promote their role in society.
3. Attract, develop and retain high-end digital skills and talent. Increase the quantity and quality of digital entrepreneurial skills and talent; boost the development of a unique blend of creative, technology and entrepreneurial skills.
4. Ease the access to finance and enhance investments. Improve access to finance for each stage of enterprise development and support the growth of digital entrepreneurial ventures.
5. Boost the digitally powered single market. Improve the ease of doing digital business in and across Member States, by equally stimulating the demand and supply of digital technologies and creating economies of scale.

Figure 4 - Objectives of EU Digital Agenda



Finally, a Digital Agenda Toolbox has been developed to provide support to regional and national authorities to develop a thorough understanding of the digital growth potential stemming from the Digital Agenda for Europe. It highlights the opportunities Information and Communication Technology (ICT) offer as a key element in their national or regional research and innovation strategies for smart specialisation and related Operational Programmes. The toolbox is a useful point of reference for cities and regions interested in using European Regional Development Funds (ERDF) for ICT investments. It also provides hands-on assistance for developing a strategic policy framework for digital growth by discussing the do's and don'ts of the process and giving examples of good practices.

2.2.2. National level responses

According to the OECD's Digital Economy Outlook (OECD 2015), most OECD countries have established or are close to adopting some sort of national strategy addressing digital economy policy priorities.

These strategies are cross sectoral and in most cases aim to boost competitiveness, growth and social wellbeing. Denmark's 'ICT Growth Plan' for example, aims to support 'growth in the ICT sector as well as in ICT based growth in the private sector more generally'. In Germany the 'Digital Agenda 2014-2017 highlights 'the increased exploitation of innovation in order to achieve further growth and employment. The Italian Strategy for the Digital Agenda 2014-2020 aims to 'ensure economic and social growth, through the development of skills in business and the dissemination of digital culture among citizens'. In France the 'Plan Numerique' aims to build a more competitive digital economy in addition to targeting

youth and preserving and reinforcing social values. In the UK, the Information Economy Strategy plans to 'help the UK accelerate in the global race, focusing on its strengths'. The UK's digital economy strategy then has 5 complementary objectives as set out in the table below.

Table 1 - 5 objectives of UK digital economy strategy

Objective	
Encouraging digital innovators	We will help digital innovators in early-stage companies to articulate and develop their ideas, establish their businesses and make connections to potential partners and lead customers in industry and government. We will also help innovators in established companies across the economy to adopt digital solutions, and to learn from other sectors
Focus on the user	We will champion digital innovation approaches that centre on users' needs, to ensure that solutions are well fitted to the markets they address. These needs centre on trust, access and convenience of use, so we will help businesses to inject this thinking throughout their design processes.
Equipping the digital innovator	We will equip individual innovators with technical and business expertise and resources, and help them to develop new capability if necessary. Of particular importance are the technical toolkits to manage transactions and move data safely and smoothly, and to link the physical and virtual worlds.
Growing infrastructure, platforms and ecosystems	We will work across industries to develop and consolidate structural foundations for the digital economy, to encourage investment and guide innovators as they enter the market. We will support interoperable infrastructure and software platforms, build digital ecosystems and help them to scale.
Ensuring sustainability	We must ensure that innovations in technology are used well and can succeed sustainably. We need to understand social impact and the commercial, legal and regulatory context of innovation. This requires far more than innovation support, so we will partner with other organisations to link technical capabilities with skills, trade, infrastructure and investment, all within the context of the government's Information Economy Strategy.

Interestingly, the Digital Agenda 2020 for Estonia does not cover the use of ICT in various areas of life and policy, such as ICT in health care or business. The focus is instead on creating an environment that facilitates the use of ICT and the development of smart solutions in Estonia in general. The ultimate goal is to increase the economic

competitiveness, the well-being of people and the efficiency of public administration.

Through its analysis, the OECD has identified the following 8 key pillars of national digital economy strategies:

1. Further develop telecommunications infrastructure (e.g. access to broadband and telecommunications services) and preserve the open internet
2. Promote the ICT sector including its internationalisation
3. Strengthen e-government services including enhanced access to public sector information and data
4. Strengthen trust (digital identities, privacy and security)
5. Encourage the adoption of ICTs by businesses and SMEs in particular with a focus on key sectors such as healthcare, transportation and education
6. Advance e-inclusion with a focus on the aging population and disadvantaged social groups
7. Promote ICT-related skills and competencies including basic ICT skills and ICT specialist skills
8. Tackle global challenges such as internet governance, climate change and development cooperation

The Accenture Report 'Digital Disruption' highlighted 3 sets of key actions that business leaders and policy makers should consider when seeking to maximise the 'multiplier' effects of digital:

Table 2 - Key actions for business leaders and policy makers

Prioritise digital investments based on value opportunities	Balance digital investments so that an optimal combination of improvements in areas such as skills or technology helps you to deliver the best returns.
Compete using an industry-specific digital strategy	Be clear on which platform, what roles, and which data are fundamental to compete successfully in your industry
Create the right environment for digital transformation	Improve your “digital IQ,” teaming with government to open up cross-industry relationships and change the rules of competition.

2.2.3. Local level responses

The digital economy flourishes in cities, which have a good supply of skilled workers and strong technical and operational infrastructure.

According to the UK's TechNation report, companies are also more affected by core operational factors (broadband, skills, market opportunity) and lifestyle factors for employees (quality of life, community, personal reasons) than they are by access to finance, support from universities and sector expertise. A third of survey respondents carried out as part of the TechNation work considered a lack of local talent to be one of their biggest barriers to growth.

The Small Business outlook (Centre for Cities, 2015) concludes that digital SME's are not randomly or evenly distributed but are concentrated in some cities more than in others as they 'benefit from access to wide pools of talent and specialised expertise and from being in close proximity to other highly innovative businesses'. It goes on to state that 'successful clusters' (such as London's TechCity or Cambridge's Silicon Fen) 'grow organically through the decisions of firms and individuals and the interactions between them'. Cities need to be open to new residents and businesses - providing new housing, good transport and infrastructure as well as a supply of appropriate and affordable (co) working space.

Eurocities, in its statement on the Digital Single Market Strategy, includes the following areas of potential activity and influence for cities: broadband, the data economy, interoperability and open standards, cyber security, inclusive e-society, e-government, online platforms and smarter cities.

But, are there good examples of city-led initiatives or strategies to promote the digital economy?

The answer is that there are lots but most are in large, thriving (often capital) cities such as Barcelona, London, Stockholm, Tallinn and Berlin. These cities are buzzing with people creating new digital businesses and companies developing exciting new technologies. The new European Digital City Index (2015) maps the factors which attract and drive digital entrepreneurs. It scores EU capital cities (and 7 'hub cities') against a range of themes[1] to rank the cities in terms of their 'start up' and 'scale up' capacity and performance. Perhaps not surprisingly, London in '1st place' for both start ups and scale ups (followed by Amsterdam, Stockholm, Helsinki and Copenhagen).

[1] Access to Capital, Business Environment, Digital Infrastructure, Skills, Entrepreneurial Culture, Knowledge Spillovers, Lifestyle, Market, Mentoring & Managerial Assistance and Non-Digital Infrastructure

However, cities of this nature don't necessarily offer useful lessons for TechTown partner cities, which are smaller, less well connected and often have access to fewer resources. On the whole smaller cities like these have less developed digital economy strategies – or indeed (as is the case with the majority of TechTown partners) none at all. This is the very reason that TechTown was developed.

There are of course some examples of city-led initiatives, which provide a useful point of reference and a few examples of initiatives from which it is hoped lessons can be learnt are presented here.

The first is Dublin, Ireland and its **Digital Dublin** (2013) initiative which aims to identify, map, benchmark and set targets for the development of a 'Dublin that is innovative, and uses digital tools and solutions effectively, efficiently and assists to drive the economy of the city'.

Digital Dublin is an alliance of Government, Business, Higher Education and Citizens. Known as the Leadership Forum, this group provides the collaborative and co creating leadership for Digital Dublin bringing together key players from across the digital ecosystem. This structure is said to enable the group to capture ground-level opinion and representation from citizens, civil society, academia and enterprise.

Digital Dublin has recently developed a Digital Masterplan for the City. This provides a guide for the city in terms of adaption, creation and adoption of digital technologies and processes. It aims to lead to more efficient overall management of the city, its resources and everyday activities. This masterplan encompasses the following principles:

1. That digital technologies are a facilitator of a more sustainable, cohesive and competitive city region
2. That digital technologies are used to realise net job creation across the entire economy
3. That 'Available As Digital' will be the norm for all Public Services
4. That as a progressive open city, welcoming of everybody, all citizens should have opportunities for access to digital technologies
5. That we will live by and act through open innovation, embracing a governance model which shares ideas, information and data between sectors, organisations, citizens and with other collaborating cities
6. That we will embrace digital governance and technologies to increase democratic participation and to stay connected with citizens
7. That the city and its stakeholders will use digital technologies, processes and design to continually improve its own performance in the delivery of services for the citizens and business

8. That Data(Open and Big) is a key element in developing Dublin as a Digital City.
9. That Dublin will be a virtual and physical testbed for innovation and will integrate digital technologies into spaces and places of the city
10. That Dublin will consistently future proof the infrastructure (e.g. broadband, power etc) required to keep it ahead of the global competition and attractive to inward investment.

Manchester, UK's Smarter City initiative is another example of a city which seems to be embracing the potential of digital tools and business models. In this case its agenda is embedded within a 'smart cities' initiative which aim to use new technologies and new ways of working to understand and optimise city systems and change how the city functions to improve how people live, work, play, move, learn and organise.

It tackles jobs and growth (Work) alongside 5 other key themes as outlined in the table below:

Table 3 - Summary of Manchester's Smarter City Initiative

Theme	Explanation
Live	How and where we live; our houses, communities, neighbourhoods and districts; inter-generational living; quality of life and place; retrofit, regeneration and expansion.
Work	How work changes, what jobs we do, how we do them and where we do them; what new skills we have; what new industries and startups; social innovators and entrepreneurs.
Play	Access to amenities, a better environment and richer cultural life; how we keep fit; a healthy built environment; a child-friendly city; activity throughout life; sport; our rich cultural life; Manchester for tourists.
Move	Getting around in a seamless, low-carbon and healthy way; a connected city, a walkable city, a city of bikes; trams, trains and buses; international connectivity; transit futures.
Learn	How we continue learning throughout our various life stages; the univer-city; schools, colleges and apprenticeships; libraries and community learning; the self-learning city.
Organise	How our neighbourhoods shape their future; citizen engagement in policy; an open city government, Metropolitan Mayor and new decision-making; 21st century public services.

Manchester was also one of the founder members of the European Network of Living Labs and has used user-centred practices in developing innovative new digital services and products for citizens over the last 10 years. It is also Lead Partner of SmartImpact which is a network of larger cities deploying smart city technologies and solutions at a district level as

a mechanism to help secure the opportunities and remain competitive.

There are many other examples of cities which are starting their digital journey and seeking to maximise the growth potential of this rapidly evolving sector. However, it is absolutely clear that there is no 'blueprint' for success. There is a clear need for more work at medium sized city level in particular to better understand the role of government and to explore 'enabling' or 'transformative' public sector interventions.

2.2.4. Some lessons from previous URBACT Networks

Below is a summary of some of the URBACT networks which have now finished from which useful lessons can be learnt:

Creative Clusters

Creative Clusters was an URBACT II network, which explored the economic value of the creative sector in small urban centres. One of the most relevant findings was the importance of an integrated approach to the local creative eco-system - see diagram below. Many of the features of this ecosystem will also be relevant to the digital and technological sector.

Figure 5 - Features of a local creative ecosystem

It is clear that there are a number of common features including the importance of incubating, attracting and retaining talent, better understanding the challenges and considering space and governance issues within integrated plans.

Creative SpIN

Creative "Spillovers" for Innovation aimed to address the challenges of how best to connect cultural and creative industries, including sectors such as audiovisual, design, advertising, architecture and video games, with other sectors, to stimulate the effects of "spill over". Its conclusions, as set out in the 'Smart Guide to Creative Spillovers' provide a useful starting point for developing a better understanding the digital economy as set out in the following table:

Table 4 - Conclusions from Creative SpIN

Step	Message for cities
1 & 8	Capture and understand your local cultural and creative resources Set up monitoring and evaluation mechanisms to understand the impact of policy measures
2	Raise awareness on the potential of creative spill-over and its benefit to the culture and creative sector
3	Raise awareness on the creative skills and competences of the CCIs to other sectors
4	Identify local "creative mediators" able to bridge the gaps between culture and creative sectors and other sectors of the economy
5.	Encourage accidental encounters
6 & 7	Establish a light structure responsible for overseeing the implementation of creative spill-overs Appoint a champion

ESIMeC

ESIMeC explored how demand-led workforce development strategies can be used as instruments of sustainable economic recovery in medium sized cities. Whilst it was sector agnostic as a whole, a number of its transnational events and 'recipes' are relevant to TechTown, in particular those focusing on:

- Partnership working and the relevant of the triple helix to workforce development in knowledge-based industries
- Integrated approaches to economic development and employment

Genius:Open

Genius: Open aimed to create innovative solutions to city challenges via an online collaboration platform and through a defined process showing how to use open innovation to engage residents, communities, companies and academics in co-creation

URBACT - Capitalisation

As well as building on some of the previously funded networks, the findings of URBACT's capitalisation workstreams are also relevant and in particular:

- **More Jobs Better Cities** (URBACT, 2013) - TechTown's proposed approach to the digital economy is very much in line with the framework for city action on jobs developed through this workstream. It aims to address the job creation potential of the digital economy from the economic and labour market perspective and consider the importance of cross cutting issues such as intelligence, governance and connections. As well as looking at digital jobs per se it will also explore how existing (manufacturing or industrial) jobs can be transformed through digitalisation.

- **Job Generation for a Jobless Generation** (URBACT, 2015a)- whilst TechTown does not directly target young people, one of the challenges to be addressed in partner cities is how to better match the digital skills of the workforce with those needed by businesses now and in the future. This, along with the planned work on growing and retaining talent is very much in line with the 7 habits and youth-proofing recommendations which came out of the job generation work.

- **New Urban Economies** (URBACT, 2015b)- one of the main conclusions of URBACT's work on new urban economies was the importance of the digital economy to Europe's cities. The final publication highlights this sector as a 'cradle of new entrepreneurship', at the same time as explaining how digitalisation is also helping to revive urban manufacturing in some places. It also states that medium sized cities also stand to benefit - particularly where they have a technical university to help them attract and retain talent.

2.3. Role of cities

'We are not only just users and consumers, we are also becoming inventors, creators, artists and producers. We can share data, experiences, networks and ideas to co-create, to co-share, to co-invent, to co-produce. We crowdsource, crowdfund. We like to experiment because that is what makes us thrive. We develop the sharing economy on the basis of existing concepts, but from a totally different angle and we are open to change. We don't aim to buy, own or possess. We rent or lease services and share them to become more innovative and efficient. We don't want to own knowledge and keep it to ourselves. We provide it to others and try to evolve and spiral upwards together. We put trust in the digital economy and invest in it and in the necessary skills to exploit it to the fullest. We don't develop linear production lines. We develop circular ones, so we can reuse materials and rely much less on our scarce resources. These are the new societal and business models'.

Neelie Kroes and Sigrid Johannisse 'Digital minds for a new Europe' (European Digital Forum, 2015)

So, what does all of this mean for TechTown partners? What can small and medium sized cities realistically do to grow jobs through a digital economy? What margins of manoeuvre do they actually have when so many pieces of the macroeconomic and policy jigsaw are outside of their control?

It is clear that cities are in the process of experiencing a digital transformation, one which brings the citizen closer to the city and, if optimised, creates jobs and develops human capital. 'Digitalisation is changing the way people live their lives, giving them a voice and an opportunity to participate in the delivery of public services' (Busch, Digital Minds, 2015[ii])

The literature review suggests that there is much that cities can do on both the demand and the supply side of the economy. This includes:

- Facilitating open access to data for developers, e.g. mapping, meteorological and real time public transport data as well as information on community level services.
- Enhancing connectivity and making wifi more widely available in public, business and education spaces.
- Leading by example by e.g. embracing app-driven / digital innovations across all sectors, and services, e.g. health, education, enterprise, lifestyle, wellbeing.
- Ensuring a flexible and supportive business environment for start-ups and entrepreneurs – providing affordable spaces, co-working spaces, networking opportunities, flexible business support and access to finance programmes – so as to make it as easy as possible for people to start and grow digital companies
- Linked to the above, creating living labs for start ups and scale ups with a lighter regulation load and where expertise, talent and investment can co-exist to promote the new European digital entrepreneur
- Facilitating labour market flexibility and promoting STEM skills development in local schools and training providers (Science, Technology, Engineering and Mathematics) to meet demand
- Encouraging a risk taking, entrepreneurial culture where failure is not frowned upon but rather embraced
- Brokering relationships and networking opportunities – e.g. between large and small companies, between 'luvvies and geeks', along supply chain, between digital companies and others needing digital transformation, between research institutes / education providers and SMEs

Perhaps the biggest challenge of all is the need to accept and embrace disruption.

Traditional methods and models will be threatened and transformed through innovation and digitalisation. Some cities may not feel comfortable in this new space. They may not understand it or their role within it. However the message is clear: 'Adapt or Die'....

> *'The future of the smart European digital economy is not five, ten or fifteen years away - it is right now. Therefore the message much be: Adapt, or get left behind'* (Joanna Shields, Digital Advisor to the UK Prime Minister in Digital Minds, 2015).

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