



THE DIGITAL ECONOMY

Winter 2018

“The strength, the solvency, the influence of Britain ... these things are going to depend in the remainder of this century to a unique extent on the speed with which we come to terms with the world of change.”

Harold Wilson
White Heat of Technology, 1963

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AN INTRODUCTION FROM LORD SALISBURY

Public debate is vital in the modern age. We currently see around us technological developments the like of which we have not seen since the development of the printing press. These developments will have huge and unknowable consequences. The places in which we live will change; the way we work will change; the way we experience leisure will change. And this will affect everyone, wherever we live. This kind of social change reduces peoples' trust in the institutions which govern them and the people who run those institutions.

Public debate is better than secrecy in the development of policy. This is particularly true of today's technological revolution as it empowers individuals even more than the invention of printing. It becomes all the more important, therefore, for policy makers to engage with local government, especially with individuals, to give everybody a chance to help build the plans that eventually emerge, instead of presenting them to an astonished world as a *fait accompli*.

We in this part of Hertfordshire have found using architectural charrettes to be a useful way of achieving this. The term, I believe, comes from the eighteenth century architectural schools in France where a miniature cart was circulated round the students' table, into which they would pitch their designs and ideas.

We are delighted to be in partnership with the Hertfordshire Chamber of Commerce in sponsoring these infrastructure charrettes. We hope that they will similarly stimulate ideas and build consensus for making our part of the country an even more attractive place for people to live and work.

A handwritten signature in black ink, appearing to read 'Salisbury', with a large, stylized initial 'S'.

Lord Salisbury

THE DIGITAL ECONOMY

The Digital Economy was the fifth session of the Hertfordshire Infrastructure Charrette. This time we were welcomed to the offices of Woodhouse Workspaces, in Hatfield - a fitting venue to follow up the previous workshop exploring the kinds of workspaces in which we might like to spend time in the future.

The event offered a panoramic view of the possibilities technological progress offers us, as well as the dangers it may throw up. It offered the County Council's current perspective on technological change, and its approach to harnessing this for citizens; as well as a view on the amount and cost of physical infrastructure required to underpin a flourishing digital economy and the possibilities, challenges and changes to our lives this is bringing.

The Digital Economy was perhaps the most broad and difficult of the infrastructure topics we have considered to date. It is a vast topic with potential to impact almost every aspect of our daily lives. As with all systems which we use on a daily basis, we frequently give little thought until we are excluded or unable to access our broadband. This underscores the need for a robust approach to systems and their delivery if Hertfordshire is to face the changes to come with confidence.

Elon Musk

Founder, Tesla, Space-X
Ex-CEO, Paypal

"If you go back a few hundred years, what we take for granted today would seem like magic - being able to talk to people over long distances, to transmit images, flying, accessing vast amounts of data like an oracle. These are all things that would have been considered magic a few hundred years ago."

Kai-Fu Lee

Author of *AI Superpowers: China, Silicon Valley and the New World Order*

"Realizing the newfound promise of electrification a century ago required four key inputs: fossil fuels to generate it, entrepreneurs to build new businesses around it, electrical engineers to manipulate it, and a supportive government to develop the underlying public infrastructure.

Harnessing the power of AI today—the "electricity" of the twenty-first century—requires four analogous inputs: abundant data, hungry entrepreneurs, AI scientists, and an AI-friendly policy environment."

The workshop raised questions for all of us - citizens, local authorities, employers, employees, educational institutions and civic groups - in particular as to how we might achieve an acceptable balance between the pressures of change, development and our daily lives.

What does a prosperous, successful Hertfordshire look like in the years ahead?

What are our ambitions for digital connectivity in the area?

Where do we want to be in 2025, 2030, 2050?

How do we collaborate best?

Where are we now; are we on the right track?

CONTEXT: LOCAL AND GLOBAL

Hertfordshire has traditionally excelled at innovation. In the field of housing, it is home to numerous New Towns and the world's first Garden Cities, whilst in the world of technologies, it is the birthplace of both the jet airliner (Hatfield) and fibre-optic cable (Hitchin-Stevenage). Like all areas of technology, engineering and people's requirements constantly evolve. We cannot as a County stand still and must remain aware, and equipped, for the future.



In **Tallinn**, Estonia, it takes three minutes to fill out a tax return, online. A company can be established in eighteen. The country's 'e-Estonia' project has made 99 per cent of government services available digitally. Internet access has been declared a human right, and 4G mobile connections reach almost everywhere in the country. Children are taught programming at school - some even taught to create Bitcoin applications.

Both government and private enterprise are harnessing the connective capacities of digital world. Whilst hundreds of programmers and software engineers have long been pushing the boundaries of interconnection, with Skype, Transferwise and now electronic delivery robots, the government has extended a digital identity scheme ('e-Residency') and will next year launch a digital nomad visa allowing young entrepreneurs and workers visiting the country to stay for a year and access the vast single market of the European Union.



In **Rotterdam**, Europe's largest port, blockchain technology is being used to underpin financial transactions surrounding container rentals. Fieldlab Blockchain, a partnership between the municipality, the Port of Rotterdam and several companies, is working to bring more applications of the technology to fruition. PortXL, the world's first maritime startup accelerator, gives places and support to promising innovative maritime technologies and enterprises. It is part of the now-flourishing tech ecosystem in this port city, through which over 13 million containers passed in 2017.



President of the Netherlands Maritime Technology Association, Bars Ort, says the key to Rotterdam's primacy in modern maritime technology is a collaborative approach: "You need to be on the cutting edge of technology developments all the time to keep a competitive edge. So everyone has to work together: knowledge institutes, research institutes, the components industry, the supply industry."

A startup in **Bilbao**, Spain, is developing a binocular camera, effectively a micro-satellite weighing just 12kg and capable of taking photographs of the earth at a fraction of the cost of an Earth Observation Satellite.



The Basque government (an autonomous region of Spain, like Catalonia, or Andalusia), has driven the development of one of Europe's most comprehensive startup ecosystems, in particular for hi-tech initiatives in automotive, energy, aeronautics engineering, as well as biotechnology. Director General of Beaz, the Biscay government department dedicated to advanced technology



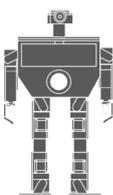
startups, Ainaro Basurko, says the approach has been one of coordination and stewardship. “We work hard in the area of coordination between private and public bodies, between universities, technology centres, government offices and big companies, and this is a main factor in our success.”

Offering support, from seed funds to angel investors, to mentoring, incubators, product design accelerator programmes and access to lawyers, consultants and marketing, Beaz has proved successful. Of the 183 startups assisted by the department between 2011 and 2015, survival rate was 86 per cent.



Just along the railway line from us in Hertfordshire is Europe’s fintech capital: **London**. Last year, London’s tech companies attracted record investment of almost £3bn. The capital hosts the headquarters of 14 of Europe’s 47 unicorn companies (from startup to £1bn value), and is currently seeing the £1bn Google ‘landscaper’ rise from the ground in Kings Cross.

Eileen Burbidge, partner at Passion Capital, and chair of Tech Nation, suggests this is a unique global ecosystem: “It’s as if you have Silicon Valley, plus New York, plus DC, plus Hollywood all in one place. We have the country’s biggest tech sector, we also have the financial sector and the policy makers. I can take a cab and go from the board meeting of a really innovative startup to Whitehall to have conversations with policy makers and then go and talk to a fellow investor in the same day. You couldn’t do that anywhere else in the world.”



Around the world, as we speak, sit, read, work, play, technology is being developed and the way in which we will live in the years ahead is being determined. Applications to merge tech with the human body, bioengineering solutions to human diseases, or for maximising human capacities; energy storage is being enhanced, and artificial intelligence is progressing rapidly - in the guise of autonomous vehicles increasingly seen on streets around the world, or embedded within advanced robotics on the Hatfield Business Park.



Hertfordshire is in the privileged position as home to many companies in the vanguard of this change, and sandwiched between many more in London, Oxford and Cambridge. The question for organisations and government across the County, then, is what kind of place we want it to become, how can we harness our vast assets proactively, and how can we best work together to achieve this all. It will not be enough to say that Hertfordshire is already doing okay. Indeed it is - and we must ensure that the staggering possibilities of technology enhance social cohesion and quality of lives across the region.

This will require a hard-won understanding of how technology is changing the world. It will require a roadmap of where we want to get to. And it may even, at times, require an understanding that the best solution may not always be technological.

WIDER UNDERSTANDING - WHAT WE LEARNT

The government has four Grand Challenges. These are difficult to discuss in isolation, but are exciting where they overlap - like the branches of a Christmas tree which we can decorate as we choose. Government has a role in convening a critical group of stakeholders to drive the future of the digital economy, to curate this decoration together.

Paul Clarke, Chief Technology Officer at Ocado, noted that the future of mobility is about smart, digitally interconnected ecosystems. It is about technologies such as 5G and lidar and the many others which make this possible, it is about the intersection of drones, robots, cars and vans and so on, autonomous clean energy powered vehicles which will affect the quality of movement and of life all our over our planet - from cities and rural environments to dangerous places where humans may prefer not to tread.



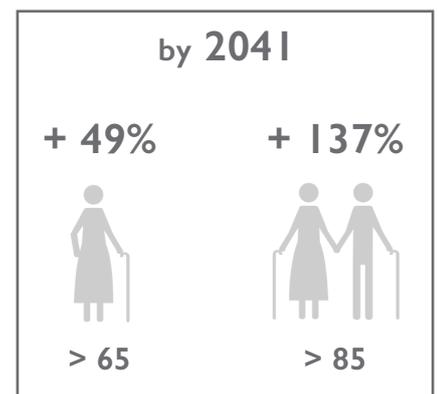
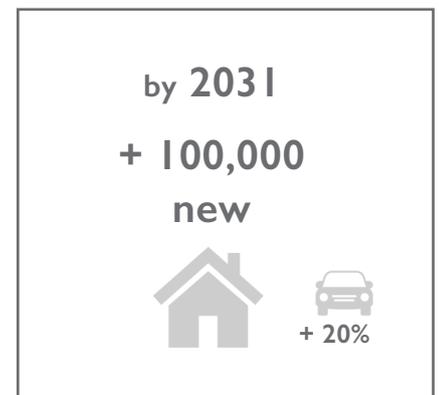
This will disrupt business models: logistics firms will become taxi firms; car manufacturers will become internet search and entertainment providers.

At the same time we are facing a demographic shift which will challenge already strained public services. In Hertfordshire in 2041, there will be one and a half times as many people aged 65 and over. There will be a 137 per cent increase in people aged 85 and over. Whilst the population ages, it is also simply growing. Health, education and transport infrastructure will be strained if it does not move forward to meet these challenges.

Even earlier, by 2031, we will have seen 100,000 homes built across Hertfordshire, and a corresponding 20 per cent rise in traffic levels across the County. For some already-congested roads, this will prove impossible at current rates of car usage. Hertfordshire presently has one of the lowest usage numbers of public transport in the entire country. **Anna Morrison, Assistant Director for Improvement & Technology at Hertfordshire County Council** reminded us we must get to the crux of understanding these problems before we might begin to solve them. Indeed, to maintain the current quality of life across the County, this usage pattern will have to change, and doing so will require proactive and genuine vision and engagement.

These challenges are all intertwined, and will not be solved by one party alone. They affect all of our prospects for a healthy, happy life. Expensive homes force key workers to live further away from their workplaces, their long commutes decrease their quality of life, their economic output, and busy the roads. An increase in traffic yields pollution, reduces air quality and leads more people through the doors of our health care system.

The County Council currently has an award-winning website enabling digital access for many services, and a digital strategy for its own endeavours. The libraries of Hitchin, Hemel and Watford are not stale impressions of old



by 2025

Ultra fast



to

10,000,000



fashioned places, but hi-tech, inspiring places which offer creator space and promote digital resources to our citizens. To build upon this, Anna asked whether it would be worth developing a Hertfordshire-wide strategy, together, and whether this is something on which the LEP should lead.

Indeed, connectivity does not stop at administrative borders and yet further collaboration will be required. The Connected Counties Programme (CCP) is a useful example of this. Buckinghamshire and Hertfordshire have worked together for several years to bring superfast broadband to 97 per cent of homes in our counties. Openreach enable developers to apply for FTTP installation free of charge to new developments of over 30 homes.

As **David Jordan, NGA Manager across the South of England for Openreach**, noted, the digital network that is built across fibre is the backbone of the UK economy. As the CCP delivery partner, Openreach has delivered full fibre to 20,000 homes since 2015, and will expand this to a further 34,000 in the years to come. What's more, the initial 20,000 homes were predominantly fibre-to-the-cabinet (FTTC). Whilst this was significant progress, the next 34,000 aim to be delivered as fibre to the premises (FTTP) enabling speeds of up to 1Gbps - a whole new infrastructure to offices and homes which provides faster services and eliminates the need for further green boxes on our streets.

The CCP is significant progress, but it was noted that the County needs more from both Central Government and local planning departments in terms of policy, and engagement from developers. It is unacceptable for **any** homes built in the twenty-first century to have anything but ultra-fast broadband connectivity. It is 2018, internet connectivity is as important to the functioning of our economies as water is to our bodies. The UK Government aims to have ultra-fast broadband (100Mbps) everywhere in the country by 2033. In line with this strategy, Openreach have committed to deliver ultra-fast full fibre networks to ten million homes by 2025, subject to the right market conditions. (There are circa thirty million homes in the UK).



It was stressed, strongly, that it will be important to ensure places which are built in the years ahead develop and enhance quality of human lives through digital progress - not simply enabling the hyper-efficient movement of 'atoms' in a system. Hundreds of thousands of homes are being built, and we must ensure they are incredibly well-connected and the future places in which we will live are embedded with smart services which promote community cohesion. **Side Walk Labs, Toronto** is a bold plan led by Google to create an incubator for this approach. We must do the same in Britain as well. Ocado are working on plans to turn the Hatfield Business Park into a pilot for smart transport, alongside the HCC and the University of Hertfordshire, amongst others.

There are bumps in the road ahead; there are significant legislative challenges to negotiate. And significant challenges around the management and curation of reams of data which we have. If everyone continues to do their own thing we will not make the best use of our finite resources.

WORKSHOP: WHAT DOES A PROSPEROUS HERTFORDSHIRE LOOK LIKE?

Taking the Temperature

The world is changing around us. Technology, robotics and AI will change the way we live our lives in the years ahead. Over three quarters of the audience stated that they feel optimistic about this change.

Our workshop aimed to bring people together, and - as participants - to discuss our own aspirations for a future Hertfordshire, and how we might work together to achieve them.

There are, it emerged, two principal challenges:

1. Facing Uncertainty.
2. Collaboration.

Uncertainty as to our ultimate aims, uncertainty as to what changes are coming, and when, uncertainty in our own capacities to harness as-yet-unknowable changes.

Whilst this uncertainty could be paralysing, we must use it as a catalyst to meet the second challenge - collaboration. We cannot know our ultimate aims, nor how to get there, without working alongside others. We cannot know what changes are coming, and when they might arrive, without close relationships between those in research and development, those embedded within communities, and those making policy.

There was a shared understanding that no party could achieve our desired ends alone; that it will only be by working together that we might harness the opportunities which lie ahead and change our places - and our lives - for the better, not the worse.



Collaboration - What do we need?

To bridge the gap between words and reality of digital infrastructure.

Everyone wanted to have a clearer understanding of technological progress and hear from those at the coal face of development.

Digital Skills

All employers want well-educated highly-skilled staff. Most do not understand how best to seek or to find the opportunities for lifelong business education.



A clear direction

Everyone needs information, or guidance, but also to understand what it is we are striving for.

Collaboration - What do we offer?

As a local planning authority



Policies to make sure we have fast broadband
Leadership, and opportunities to try new technologies
S.106 funds and developer relations
Working collaboratively, achieving economies of scale

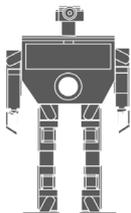
As an educational institution

Flexible education for the future
Sharing of knowledge between the young and not-so-young



Aspiration - Where are we aiming?

What do we want Hertfordshire to look like in ten, fifteen or twenty years? How will we move around, where and how will we meet people, where will spend our time and how might we work?



Similar visions of the future emerged across the room. Almost all want to see walkable, flourishing communities, highly-skilled and well-educated citizens, and pioneering companies in the local area. Some outstanding suggestions include, reinvigorating struggling high street retail by changing the nature of the town centre: perhaps the community centre of the future is a WeWork style hub, in which people can work, access local services and spend time with friends, family or colleagues. This can be walkable from their home and, if densities are increased to meet housing needs, increase social cohesion of more residents.



Educational institutions and businesses must share responsibilities and work together closely to develop skills required by local citizens. Local authorities - and companies performing statutory services - must open up their data for developers and researchers to use to best understand how services, whether healthcare or transport, can be tailored to the needs, desires and behaviours of the local citizenry (or the other way around).



The Local Plan process is seen as a way of offering community-wide opportunities to embed visionary thinking from the beginning of new settlements or neighbourhoods. It will be important to harness these, to keep students and young people in the local area, to ensure collective approach is taken to securing funding for costly and innovative infrastructure, and to embed the idea that digital connectivity is a tool for the better living of human lives - the importance of places for the human heart and mind must be acknowledged, and existing behaviours cannot simply be digitised, but the opportunity must be taken to encourage healthier choices for our lives.

CONCLUSIONS

Hertfordshire must increasingly consider itself in the context of a world stage, and not simply as a small or insignificant sub-region of the United Kingdom. Across the world, we see innovative cities such as Bilbao, Porto, Rotterdam, Tallinn, even Luxembourg and of course here on our doorstep - in London, Cambridge, Bristol, Liverpool, Milton Keynes and beyond. There is rapid progress happening everywhere in the world as we sit, read, and speak. It is impossible to chart the course and pinpoint a destination of this progress - but it is necessary to be ready.

It will not be enough to say, "Well, Hertfordshire is kind of okay". There are stark challenges with housing affordability across the county, damaging acute problems of poverty and deprivation. As well as this, everyone's quality of life can be diminished by poor connectivity - whether over land or the internet.

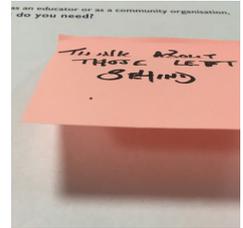
The key question in our discussions on technological change, therefore, are - how can we best enhance social cohesion, how can we best bring people together through technology, rather than isolate us further in the future.

We must embrace these changes with curiosity, and excitement. And yet we must take care to realise that the best solution may not always be technological. We should pursue and regulate technological change with our 'eyes open'.

There is appetite for a more aspirational and courageous vision.

There is appetite to work together, to collaborate, to share aspirations and understanding.

As in other areas, explored at past Charrettes, the hope is that we can return to this topic again in the future - learning from others and sharing insights on how best to bring about positive change for Hertfordshire.





*"We overestimate what we can achieve in a year.
We underestimate what we can achieve in ten."*

Bill Gates



GASCOYNE CECIL
ESTATES



Hertfordshire
Chamber of
Commerce