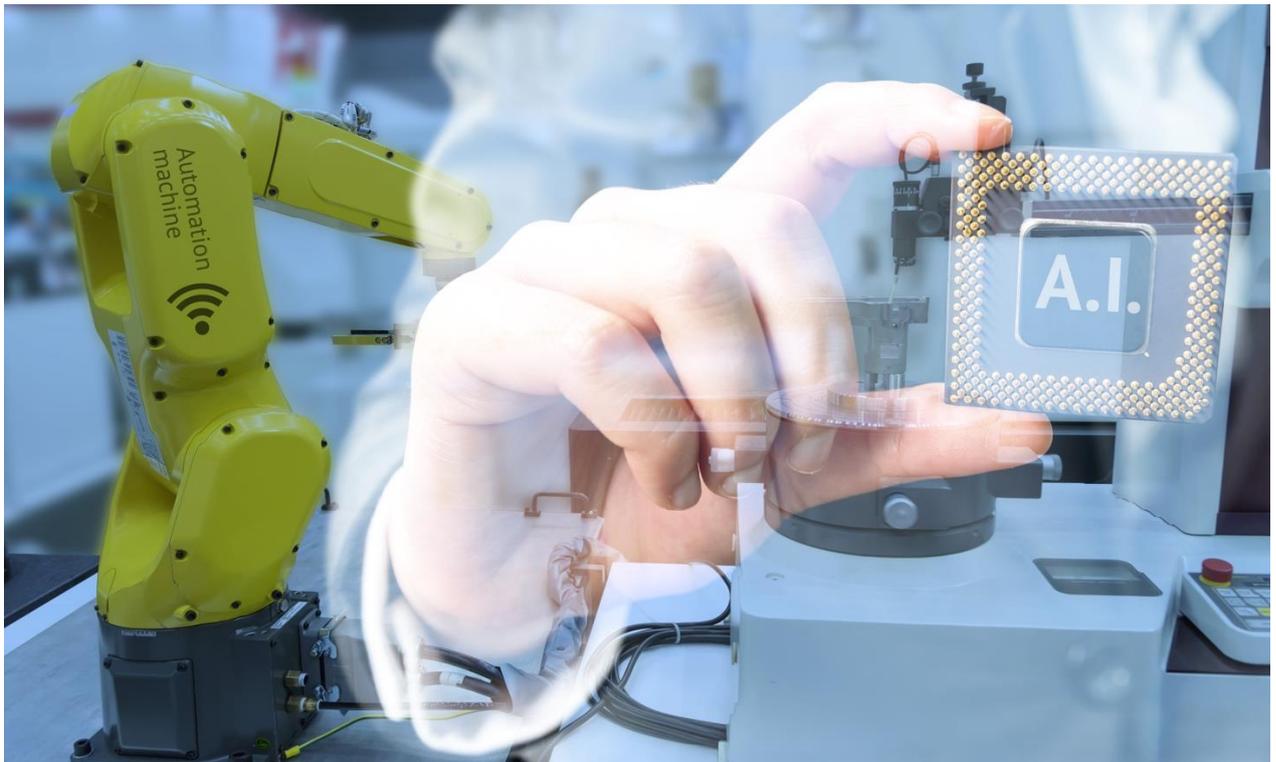# BIG INNOVATION CENTRE

A New Future! How Artificial Intelligence and the Fourth Industrial Revolution can Transform Britain's Regions

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All-Party Parliamentary Group on the Fourth Industrial Revolution (Secretariat)

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By 2025, all UK regions and sectors must be fit for the Artificial Intelligence (AI) revolution – everything from driverless cars, smart energy, health care to finance and social housing. A long period of adjustment with systems that co-habit is very unsafe. It is also more expensive to run two systems ('smart' and 'dumb') than one. To discuss what this will mean, this provocation set to discuss the practical aspects of the coming era of '**data capitalism**' and AI in UK public services, and the changes in policy and regulation this may require.

DATA CAPITALISM MEETS PUBLIC SERVICES

We often talk about how AI changes business and consumer relations. In particular, we talk about how supply chains are disrupted and transformed by **intelligent agents** (as Alexa or a chatbot) interacting directly with people, the **Internet of Things** changing consumer buying habits (e.g. via connected homes and smart grids), and **information exchanges** via online data-driven platforms resulting in public and private data meshing.
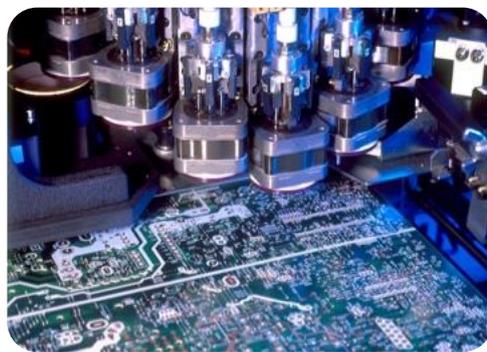
AI as Software



AI overtaking tasks
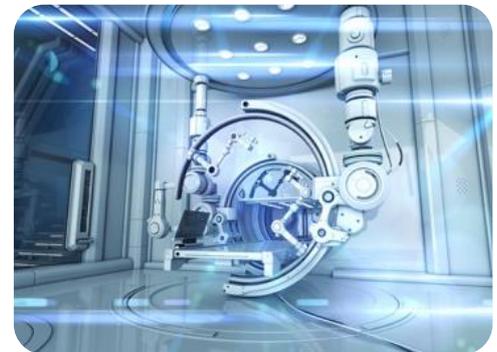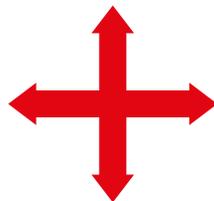
General overtaking by AI / Sci-Fi

AI as Robots

But we talk less about how AI and these new 'market institutions' affect public services and regional development making decisions on policy, regulation and the budget. It is in the public

sector that some of the biggest new opportunities from AI are to be found, but this requires rethinking the rules, norms and standards in how data are used. **Data is the new driver of growth as machine learning, intelligent homes, automated decision making and robots are fuelled by our data, but they need to be released and available**.

As the 'big data' concept took-off we explored what new value could be archives for business and society. Big Innovation Centre co-hosted a hackathon with Camden Council in London, big corporates and computer scientists. It was in relation to **how big data could make public services more efficient with respect to repair services on council housing, handling crime and delivery of ambulance services**. At the time, the Guardian covered the story as *"Councils call in the geeks to help them solve local problems" and later "Big data: Camden Council leads the digital revolution"*.

We were inspired by the New York City Mayor's Geek Squad that opened up their information archives on such things as the number of heart attacks and fires that occur inside their buildings, whether residents have logged complaints about roaches or construction noise and the performance of their boilers and sprinkler systems. Additional data was gathered about New Yorkers including their businesses, commuting habits and down to more granular information, such as, the number of parking tickets and fines they had received.
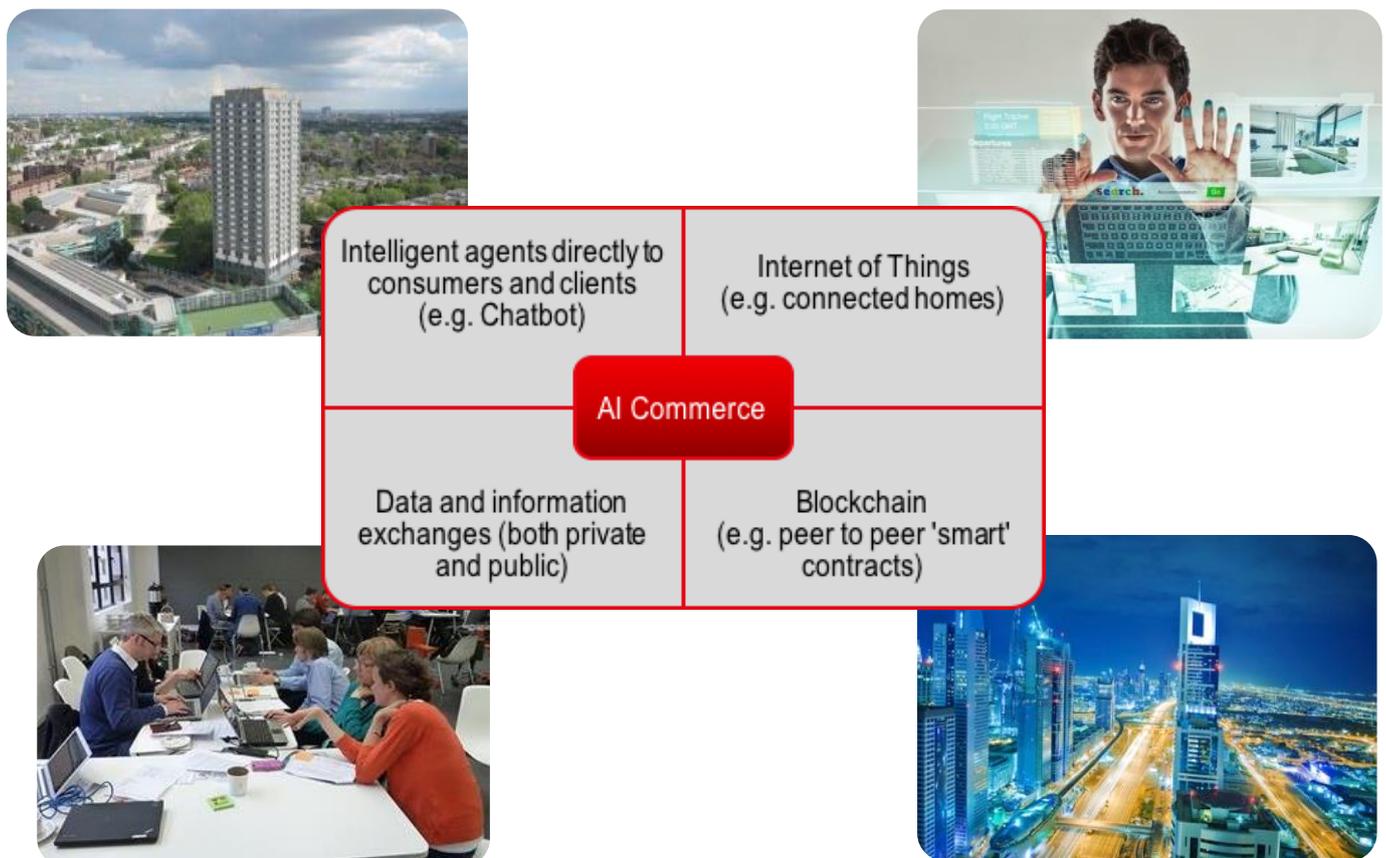
At the London hackathon (see picture above) we found that despite the obvious opportunities of big data (which is really personal, business and environmental data held by public and private organizations) they could not be opened to combat the investigation in sufficient details, and online public data access and text mining from the web or other AI tools can only get us so far. The issue was no confident authority to open (anonymised) data. Worse, data

was not reported on central topics, e.g. in relation to social housing. Three years on, nothing or very little have changed. With the recent Grenfell tower tragedy, **the situation has become much more urgent.**

MORE PUBLIC TRUST WILL GENERATE GROWTH AND WELFARE

Previous policy is around *data protection* and exclusive rights on data, but what is needed now is regulation around *data use* providing *incentives to share*.

New policy enabling trusted sharing of personal and business data is essential for new and innovative business models (digital entrepreneurship) to take off in the UK. It is also the only way for individuals to reach the benefits from Big Data, Internet of Things, Artificial Intelligence (AI) and most of the other digitally enabled disruptive innovations. **We need to make a Smarter Society concept a reality, and the public sector must lead.**

Such a move would not be without its rewards. One estimate by the BCG is that the **applications created with personal data have the potential to generate as much as €1tn of value in Europe annually by 2020**, with a third of the total flowing to private and public organisations and two-thirds accruing to consumers.

However, for this value to be unlocked, the public and consumers need to feel comfortable about sharing their personal information. Yet too many are extremely wary about abuse, turning away significantly from organisations which they believe could misuse data, and they are generally not swayed by monetary or social incentives to release their data.

People need confidence and trust in the organisations that hold their data, in particular that the conflicts of interest, privacy and ethical issues will be addressed, and that proper redress is available when there are problems, transgressions or grievances.

As a holistic solution, Big Innovation Centre proposes a 'Data Charter' on the use of personal and business data, including a 'Fair Use' and an 'Opt In Unless You Opt Out' approach to data disclosure:

- By introducing the *'Data Charter'* on what can be done with personal and business data, everyone will know how their data is used, which in turn increases trust and creates incentives to allow data to be shared. This Charter would mean a shift from policies around controlling the data itself to how the data is governed. As a first for Europe, the Data Charter should actively send proposals to the European Union to advance into EU Data Protection legislation and harmonisation across borders.
- The Data Charter should be used as a reference for *AI Ethics Boards* in companies to set transparent principles on how data will be governed. It could also become the basis for a *Consumer Data Watchdog* dealing with data issues around which consumers can unite enforcing trading standards surrounding their data.
- Such Data Charter should also introduce *'fair use'* of personal and business data if people are not competing with the owners of the data or harming their ability to monetise it. This would create a genuinely free space to innovate by supporting

entrepreneurship from the data revolution.

- There should be an ***equal access to data platform*** or ***shared information system*** on which AI data be retrieved in a user-friendly way by the public, so people can know their public record and benefit from knowing information about themselves in a structured way.
- Finally, the Data Charter should also adopt an *'opt-in unless you opt-out'* approach to personal and business data disclosure. Allowing citizens from birth to be born into a data sharing revolution (in which a Data Charter is governing the use of data including how business can deploy private data) will empower each citizen. Just as there is no point in being the only one with a telephone or on Facebook, people and companies could only capitalise on the opportunity from personal data when it is shared.

ARTIFICIAL INTELLIGENCE SHOULD INFORM THE INDUSTRIAL STRATEGY AND THE BUDGET

The data revolution with artificial intelligence goes beyond public services. It is the foundation of our economic planning. Clearly, a 21st century government reporting framework on the economy, productivity measurements and regions, should capture the performance of the current stage of affairs. Nevertheless, the UK data system is technologically outdated, methodically stuck in the past and costly to run. Therefore, the numbers are wrong or useless.

As a consequence, the government cannot properly plan its budget, infrastructure investment, tax levels, public expenditure for research, education, skills and social issues. It also has difficulty in deciding the sectors and technologies around which to develop support strategies. Business leaders themselves cannot set sound strategies for their investment and performance efficiency challenges, especially around intangibles and business models.

Firstly, **government data collection and measurements do not capture knowledge-based services**, new forms of manufacturing, and the digital economy including the effect of new forms of work, automation, smart devices, robotics and artificial intelligence. The conceptual, theoretical and measurement frameworks developed for a physical paradigm and the past industrial revolution, need re-addressing.

For example, productivity measures used by national income accounting focus on quantities produced and physical measures such as machinery, buildings and hours worked. The **dimensions of quality, sustainability and service generated by intangibles are not captured even though they are vital to successful company investment and government policy alike**. Productivity measures are outdated, fitting better to the post-war industrial economy than today's knowledge-based digital economy, which is a particular disservice to the UK's thriving digital start-up industry.

Energy, health, transport, finance and retail are five major sectors where consumers are expecting improved quality and sustainability as opposed to more quantity. Most contemporary value added work is the deployment of IT and intellectual capital in production, services and manu-services: here people do not produce more 'stuff', but increase its quality. For example, consumers want help to economise on their bills and not buy more energy, they

don't want to be stuck in traffic, and they want to stay healthy. Similar for financial services.

Secondly, **the design of data collection structures is not fit for purpose, but segmented, analogue, and leaves gaps**. For example, **there is a lack of data input** to the Office of National Statistics, Companies House, Treasury, and Bank of England. Data supplied by large multinationals are better captured, but data collected from SMEs and Public Sector organisations are missing or incomplete. The same can be said for data collections from EU data (CIS) and the OECD. Problems are especially around the missing 'innovation systems and intangible asset' data.

Thirdly, **data are not collected for a specific purpose** – as for example to develop our Industry, start-up or talent systems. **The industrial strategy is operating without diagnostic tools or proper context**. Same for the regional strategy, or UK's infrastructure investment.

In summary, **Economic analytics models are outdated:** firstly, they are modelled on the features of a past economy and secondly, they not taking advantages of the internet and artificial intelligence.

The vision must be to create an ambitious and trusted **21st Century UK Data Infrastructure**, which supports the growth of the economy to benefit the private and public sector alike. This means **integration of public and private data collection sources on one platform** (information system), an **upgraded focus on innovation and intangible asset data**, and direct link with **stakeholder use and purpose**.

There are lessons to be learned from China. **Transforming our regions and our supply chains to become innovation hubs like Silicon Valley, Boston or Bangalore is a major aspiration for the United Kingdom**. There are global examplars of what works. Whereas Silicon Valley and Boston developed with close links to world class Universities, Bangalore developed with close global supplier links to Silicon Valley until it became a thriving hub in its own right. Einthoven, located in a much smaller provincial part of Europe, took a different route with Philips Electronics (a big corporate) as the hub – but with a good-enough local university and looking to outsource IP and technology to an innovative supplier network. Philips Electronics crowded in expertise from world class academics – often created a link to the local university - and opened space for entrepreneurs to co-create with them locally. They invested in new buildings and converted outdated factory space 'not fit for purpose'. All the approaches created opportunities for the local regions to upgrade. However **British regions have few comparable assets, nor have our own efforts so far have shown much success**.


Systems display

China has taken a different, more systemic approach – what it characterises as an 'Opening up of the system' approach for regional and economic development, transforming regions and cities with high tech clusters, industrial parks, and taken millions of people out of poverty. The method included development from economic data and 'achievements from system construction' (as opposed to classic macro indices).

| OPENING UP THE SYSTEM	THE NEED FOR DIAGNOSTIC TOOLS TO ADDRESS
1. Modern industrial **system**	1. Is our industrial system modern enough?
2. Innovative start-up **system**	2. How innovative is our local Entrepreneurship start up system?
3. Entrepreneurial and purposeful talent **system**	3. Is our university talent system pervasive and impactful?
4. Capable global **system**	4. Do we have a capable global trading system in all UK regions?
5. People's livelihood **system**	5. What does our people's livelihood system look like in our cities?
6. Modern urban and regional **system**	6. Is our urban and regional system fit for 21st century high speed low cost transport and sustainable housing?
7. Modern management **system**	7. Do our existing management systems get it?
8. Regional demonstration **system**	8. What do our regions proto-type and do they have demonstration system fit to attract foreign direct investment?

Development from economic data
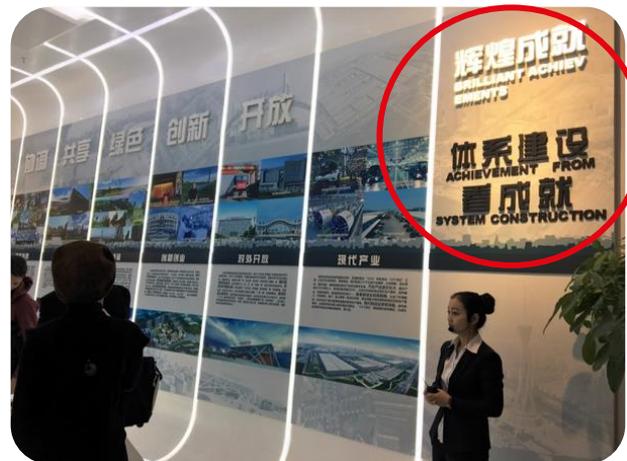
Achivement from system construction

I have visited six Chinese regions and believe there are lessons to be learned. Big Innovation Centre has piloted **diagnostics tools using artificial intelligence for a real-time online assessment of the skills base and innovation capabilities of the UK regions**, across an agreed set of industrial and entrepreneurial segments, which supply our business, trade and job base. **We investigate the capabilities of the education and talent system, which provide the skills base for the future. We address the capacities of our transport in travel to work places and infrastructure system as well as highlight areas of deprivation with respect to health, crime, access to opportunity and culture.**

Do contact us at info@biginnovationcentre.com if you want to get involved in our initiatives which can empower government agents (national and regional), local businesses, universities, property developers, and investors with enhanced decision-making capabilities.

TOGETHER

In the next wave of industrial revolution, the **UK regions, public sector and society face the same or even bigger opportunities from AI commerce and the new market structures as the private sector**. The future of our public services, the economy and how we live, work and think are at stake. We can only build this bold future together through a necessity of a shared 21st century data infrastructure combined with a sense of community. Public entrepreneurship and the UK start-up and innovative businesses are vital for this future.
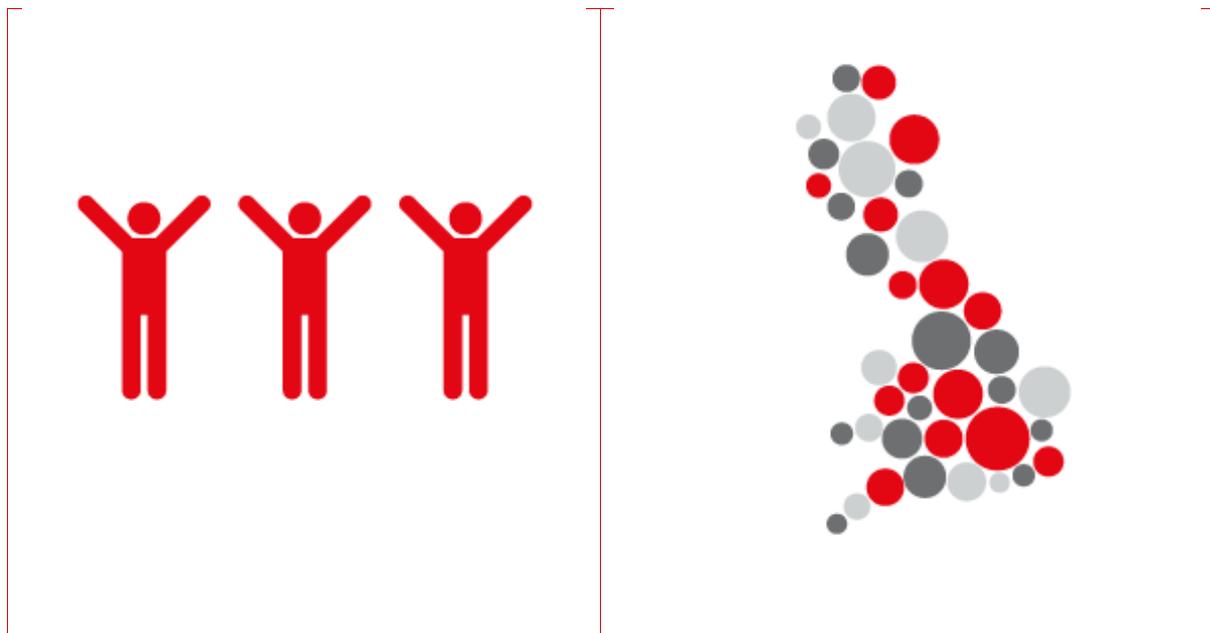
Where is Britain's strategic ambition?

Professor Birgitte Andersen, CEO & CoCreator
BIG INNOVATION CENTRE