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# On the Way to Welfare 4.0 – Digitalisation in the United Kingdom

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## UNITED KINGDOM

### 1. ABSTRACT

- In particular due to the performance in the mobile sector, the United Kingdom is among the global leaders with regard to digitalisation. However, development is slowing down, not least because of such fundamental uncertainties as whether Brexit takes place and how, and the instability of the political system which it reflects.
- Government innovation policy in the United Kingdom is centralised. The main actors are the Ministry for Business, Innovation and Skills (established in 2009) and the government's innovation agency "Innovate UK". Although the latter has coordination functions, the state is increasingly relying on "the market", for example, when it comes to funding innovation.
- The health care sector has developed a strong position in the domestic as well as the international market, but remains decisively dependent on state financial incentives, procurement and political regulation.
- In the medium and long term, modernisation and digitalisation will first and foremost transform the labour market in the United Kingdom: forms of work, labour relations and models of work. In this context the already well developed digitalisation process has an important demonstrative function for other (neo)liberal economies and welfare states. However, education policy can only provide solutions to these developments in the medium term.

### 2. BRIEF OVERVIEW OF THE POLITICAL AND ECONOMIC SYSTEM

The constitutional monarchy has its origins in the 1689 Bill of Rights, which binds the monarch to Parliament ("the king/queen in parliament"). Because of the strong position of the bicameral parliament, the UK system of government is often characterised as a parliamentary democracy.

While the lower house (the House of Commons) is directly elected and exercises the legislative function, the members of the upper house (the House of Lords) are appointed and exercise only a suspensive veto. As a result of the first-past-the-post electoral system, a two-party system, including the Labour and the Conservative Party, became established, which has only begun to be disturbed in recent years. In contrast to most European systems the United Kingdom does not have a written constitution. Instead, among other things, laws and the common law serve as legal sources. Even though Wales, Scotland and Northern Ireland, as a result of successful devolution referenda, have had their own regional parliaments since 1997, the political system can still be described as unitary, with a comparatively high level of centralisation (see Table 1).

Hall and Soskice (2001) categorised the economic system of the United Kingdom as a "liberal market economy", with deregulated financial markets, a centralised system of corporate governance (board of directors), a fragmented interest representation system, a training system oriented towards general rather than occupational and sector-specific skills ("flexible" labour markets) and relations between enterprises based on competition. The UK welfare state also has markedly "liberal" features (see Esping-Andersen 1990). The word "liberal" here refers to a model of social security that emerged in the mid-1970s, characterised by relatively limited and tax-funded social benefits, strict eligibility criteria and means testing and a relatively large proportion of private provision. There is particular emphasis on the family as a social safety net. An important exception to this "minimal safety net" in the United Kingdom is the health care system, which for the time being still offers relatively comprehensive services and, untypically for liberal welfare states, accounts for 28.1 per cent of social spending.

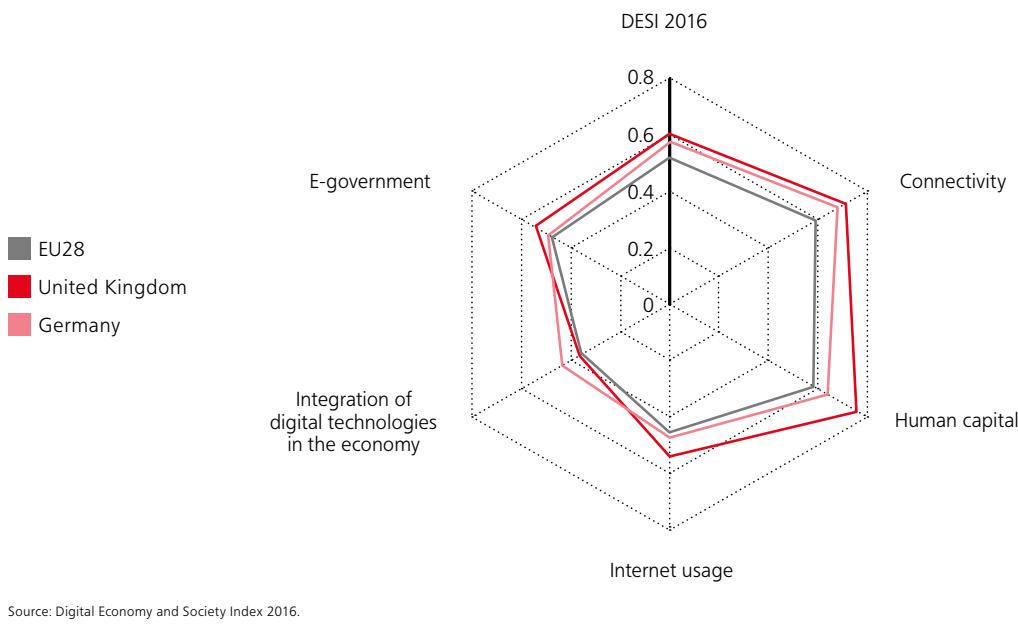
Table 1  
**Overview of the United Kingdom<sup>1</sup>**

Indicator	United Kingdom	EU28
Form of state	Parliamentary constitutional monarchy	
State organisation	Unitary	
Party system	Multi-party system	
Electoral system	Majority voting	
EU member since	1 January 1973	
Inhabitants/km <sup>2</sup>	266.4	116.7
Urbanisation (% of population)	83	74
Welfare state regime	Liberal	
Income inequality (distribution quintile)	5.2	5.2
Social expenditure (% of GDP)	28.1	28.6
GDP per capita (PPS, Index: EU=100)	110	100
Growth rate (real GDP in comparison with previous year)	2.2	2.2
Budget deficit/surplus (% of GDP)	-4.4	-2.4
Labour market productivity nominal per employee (Index: EU=100)	102.6	100
Harmonised unemployment rate	4.8	8.6
Trade union density (0–100)	25.14	
R&D total spending (% of GDP)	1.7	2.03
Proportion of people 20–24 years of age with at least upper secondary education (%)	85.7	82.7
Tertiary education in MINT subjects (per 1,000 graduates)	19.8	17.1
DESI (0–1; 1=digitalised society)	0.61	0.52
Proportion of regular internet users (16–74 years of age) in %	90	76
Internet penetration (% of households)	91	83
Proportion of households with broadband connection (%)	90	80
Proportion of companies with broadband connection (%)	96	95

<sup>1</sup> Data sources, if not otherwise specified: Eurostat, <http://www.ec.europa.eu/eurostat> (3.10.2016), data from 2016 or next available year; data on type of welfare state: <http://www.learnereurope.eu/index.php?clID=300> (3.10.2016); data on level of urbanisation: [data.worldbank.org](http://data.worldbank.org) (3.10.2016); data on trade union density: OECD, [https://stats.oecd.org/Index.aspx?DataSetCode=UN\\_DEN](https://stats.oecd.org/Index.aspx?DataSetCode=UN_DEN) (3.10.2016); data on digitalisation: Digital Economy and Society Index (DESI) 2016, <http://ec.europa.eu/digital-agenda/en/digital-agenda-scoreboard> (28.9.2016).

Figure 1

Development of a digital society in the United Kingdom by comparison with Germany and the EU28



Source: Digital Economy and Society Index 2016.

### 3. STATE OF DIGITALISATION

The United Kingdom has been developing positively in both the mobile and the broadband sectors – especially the former – and has rapidly become one of the leading nations with regard to digitalisation. As many as 85 per cent of households use broadband networks and 87 per cent of mobile phone users use mobile broadband (Akamai 2016). While the United Kingdom is some way behind the leaders in terms of broadband connection speeds, it is a leader when it comes to the connectivity of mobile connections with an average rate of 27.9 Mbps (by comparison, Germany stands at only 15.7 Mbps).

If – next to the technological dimension – economic, social and political aspects are additionally/also taken into account, then the United Kingdom, placed sixth in the 2016 DESI rankings,<sup>2</sup> belongs to the leading group of Europe. However, despite massive progress in recent years, it exhibited growth rates below average, so that the United Kingdom was characterised into the "lagging ahead" cluster, together with Finland, Denmark and Sweden.<sup>3</sup> A particular improvement can be observed in internet usage (ranked eighth), with more modest gains in terms of human capital (ranked third), by con-

trast to which integration of digital technologies in the economy (ranked 15) and in politics (ranked 16) are treading water; no significant progress can be discerned in relation to connectivity in 2016, either. Problems include, in particular, comparatively high costs and low speed, as well as the shortage of ICT specialists and below-average use of new technologies by companies.

In order to promote the development of a digital society, a national digital strategy is currently being developed within the framework of the "Digital Agenda for Europe", pooling and further developing existing initiatives. This includes, first, the "Government Digital Strategy" unveiled in November 2012, under the aegis of which administrative records and communications with citizens are to be digitalised. Among the key elements are an overarching domain ([www.gov.uk](http://www.gov.uk)) and the Single Sign-on System "UKVerify", through which it will be possible to use 20 public services, ranging from income tax to social benefits and the new universal credit. Second, there is the "Information Economy Strategy" formulated by the government, industry and academia. Its aims are to prepare the country to meet the challenges – such as the lack of qualified workers, infrastructure, internet security and market failure – related to transformation processes and to bring together and involve the different social sectors. The Information Economy Council, composed of representatives of politics, industry and academia, is overseeing implementation. Last but not least, the "Digital Skills Strategy" adopted in July 2014 is supposed to tackle the shortage of qualified workers and the "Digital Economy Strategy" introduced in 2015 is intended to boost the digital sector and accelerate innovation. All these different areas are to be integrated – also in response to the European "Digital Agenda for Europe" introduced within the framework of the "Europe 2020" programme – in a national digital strategy, which is, however, still in the planning stage.

<sup>2</sup> DESI is an index composed of five dimensions, which surveys the development of EU member states towards a digital society. Developed by the European Commission (DG CNECT) the index encompasses connectivity, human capital, internet usage, integration of digital technologies in the economy and digital public services (e-government). The Index varies between 1 and 0, with 1 representing the highest value, cf. <http://ec.europa.eu/digital-agenda/en/digital-agenda-scoreboard> (28.9.2016).

<sup>3</sup> DESI-Länderprofil Großbritannien 2016; [https://ec.europa.eu/digital-single-market/en\(scoreboard/united-kingdom](https://ec.europa.eu/digital-single-market/en(scoreboard/united-kingdom) (30.9.2016).

## 4. HEALTH CARE POLICY

Digitalisation is being implemented in health care policy particularly under the aegis of "digital health" and "technology-enabled health (TEC)". This includes digital health care solutions that integrate technology, digital media and mobile telecommunications (cf. Taylor 2015: 4). Advocates of TEC promise cost-efficient, individual and rapidly deployable solutions and thus the prospect of a future market with enormous growth potential is being held out.

The UK's digital health care sector is thriving (cf. Hampson et al. 2015: 2f, 45f). In particular the sectors telehealth and telecare have already been able to gain substantial shares – 25 and 12 per cent, respectively – in the global market. Mobile health care services, such as wearables and apps, are still in their infancy, although their growth rates are high, at 25 and 35 per cent. Similarly, the market for health care data analysis (global market share around 7 per cent) is relatively modest at present, but with estimated growth rates of 24 per cent it has considerable potential. Digital health care systems are by far the largest sector – with a market worth 1.3 billion GBP – but it is growing relatively slowly.

Despite these relatively promising figures, problems can also be discerned in this sector of the British economy, including – as elsewhere – shortages of specialist workers, a lack of digital skills in administration, regulatory uncertainty in relation to, for example, big data or mobile health care apps (data ownership), problems with the commercialisation and scalability of business models, data protection and, last but not least, inequality regarding the access to digital solutions (cf. Taylor 2015: 12f; Hampson et al. 2015: 5).

The plan is to address these problems through policy measures at various levels. Besides the government's digital strategies, mentioned above, the Ministry of Health and the key actor in the British health care system, the National Health Service (NHS), have also come up with digitalisation strategies and plans. In the case of the NHS this was integrated in the planning document "Five Year Forward View" from 2014. This document emerged from the need to develop a new vision for the NHS for the next five years in the wake of its "reorganisation" in the Health and Social Care Act 2012. Concrete measures concerning digitalisation include the electronic evaluation of specialist staff performance, the promotion of health care apps, electronic storage of patient records (through NHS Spine and the N3 network), online appointments and medical prescriptions, support for digital learning in the population and better assistance for people trying to cope with digital technologies (NHS 2014: 31f). The processing and integration of patient data in the area of data analysis is to be carried out through the data.care programme. Due to worries about utilisation rights, however, the programme has been suspended for the time being. The National Information Board has been tasked with seeking alternatives.

At the ministerial level the Ministry of Health launched the "Three Million Lives" campaign in 2011 in order to promote the deployment of tele-health care. The assumption was that up to three million people could benefit from tele-health care in the form of reduced hospital admissions and visits, shorter hospital stays and lower mortality rates. The campaign

was conceived with the help of the interim results of the "Whole Systems Demonstrator" programme of 2008, to date the biggest randomised study on tele-health care in the United Kingdom. In 2014, the campaign was re-oriented, renamed Technology-Enabled Care Services and thus expanded (cf. Hampson et al. 2015: 11).

## 5. LABOUR MARKET POLICY

By some measures the United Kingdom seems to have been very dynamic in recent years. In September 2016, the unemployment rate, according to Office for National Statistics (ONS) figures, was 4.9 per cent; almost 32 million people were in work, 23 million of those full time. But although, at first glance, these figures seem stable and to be welcomed, when taking a closer look one is struck by the labour market's rapidly changing composition. The reason for this is the enormous rise in atypical employment, which for many people has ceased to be a temporary phenomenon. The UK labour market can thus be described as fragmented. It is, for example, striking that in the past eight years the number of (bogus) "self-employed" has risen substantially (to around 15 per cent of all workers), as have the number of temporary agency workers and people on fixed-term contracts, while public sector employment has been falling due to the transfer of public assets into private hands and outsourcing of jobs ("privatisation").

Digitalisation is playing a key role in these rapid changes. A 2014 study by Deloitte estimated that up to 35 per cent of workers in the United Kingdom are at risk from far-reaching automation in the coming two decades (Deloitte 2014: 8). In this context, digitalisation is making inroads into administration, sales and distribution, services, transport, construction and production. Creative occupations remain (at present) at relatively low risk of automation, as do occupations requiring substantial social skills, such as teaching, the law, science, arts and media, health care, engineering and IT. The significance of highly qualified, social and creative occupations is thus growing.

It is thus not surprising that innovation policy at the interface with the labour market is perceived primarily as education policy, aimed at making available an adequate supply of suitable workers. To this end, the Information Economy Council published a "Digital Skills Strategy" in July 2014. Its recommendations include encouraging young people, particularly young women, to take up engineering and technology, reform of school curricula, creation of qualifications coordinated with industry and jobs in the technology sector, opening up the sector for people from other disciplines, boosting investment in education and establishing collaboration platforms for companies. In January 2016, an inter-ministerial report on "Digital skills for the UK economy" was published, with similar aims.

This focus on skills resulted from the "Information Economy Strategy", published in 2013, which was the deciding factor in stepping up efforts to tackle digital skills in the workforce. However, this first report was much more wide-ranging and also took in such areas as standard-setting, coordination of government and economy to identify barriers and problems for companies, integration of digital technologies in

companies (especially SMEs), digital inclusion and coordination between schools, universities and companies in training (for example, Massive Online Open Courses, creation of new IT curricula and so on).

## 6. INNOVATION POLICY

R&D spending, according to Eurostat, have remained constant over a long period at around 1.7 per cent of GDP. Thus, R&D intensity has long been below the EU28 average. Nevertheless, in the most commonly used rankings the United Kingdom is always to be found at the forefront of the countries investigated in terms of innovativeness. This discrepancy is due primarily to the fact that R&D spending represents only part of overall spending on innovation (organisational innovation, software, training, design and so on).

On the government side, innovation policy in the United Kingdom is rather centralised. The main actors are the Ministry for Business, Innovation and Skills (created in 2009) and the state innovation agency "Innovate UK", which is attached to the Ministry. The latter funds companies and supports them with know-how and is supposed to bring firms together in networks. In addition, there are bodies that support the work of the relevant government authorities with expertise (Council for Science and Technology, Parliament Office for Science and Technology).

In recent years, the topic of governance and coordination has returned to the agenda. The Ministry for Business, Innovation and Skills issued a report in 2014 entitled "Our Plan for Growth: Science and Innovation", which among other things calls for a clearer identification of priority industries. Other foci of the report include the shortage of specialist workers, investment in infrastructure, higher funding of research, support for innovation at an early stage and exchange with global partners in science.

Furthermore, in 2015 the state innovation agency, Innovate UK, published a "Digital Economy Strategy" aimed at giving the British economy a helping hand in innovation by means of digital technologies. To some extent it gave substance to the declarations of intent in the ministerial plan. The core points of the Strategy include a strict user centrisim, sustainability, growth of infrastructure and ecosystems, framework conditions and support for innovators. There was also a particular emphasis on digital health care services.

In order to implement these plans there must be close cooperation with institutions responsible for establishing good framework conditions, such as institutions that protect intellectual property (Intellectual Property Office), standard-setting institutions (British Standards Institution) and organisations at the cutting edge of research (the Royal Society or the Royal Academy of Engineering).

With regard to the networking of actors, in particular the universities and business, in the United Kingdom over 100 technology parks (for example, UKSPA) and over 50 university technology transfer institutions also play a role. Finally, eleven so-called "catapult centres" have been set up to support innovation at an early stage, helping companies to commercialise research (cf. NESTA 2015).

## 7. SUMMARY

The United Kingdom is caught up in a rapidly unfolding transformation affecting every area of people's lives.

In the short term over the next few years, however, digitalisation offers the UK economy an opportunity for modernisation and diversification, which ought to be welcomed, given the rampant deindustrialisation and the current stranglehold of the banks and the financial sector and a few other sectors. In particular the health care sector appears to have considerable potential because this policy area and demand for its services can be governed better than others by state authorities (for example, the NHS). In particular telehealth and telecare are dependent on state funding and incentives. Furthermore, this sector has already achieved a relatively good market position.

On the side of the government, there have already been efforts to bring together the various programmes, strategies and action plans across policy areas and to embed them in a coherent digital strategy. After consultations in January 2016, it was expected that the digital strategy would be published within the year. However, the outcome of the advisory referendum on leaving the EU has cast its shadow here, too, and there is now little prospect of publication in the near future because a whole raft of questions have to be answered first. For example, what about access of UK firms to the digital single market and, if Brexit ever did take place, what would be the consequences of a withdrawal of ICT firms or of EU citizens working in the United Kingdom or in the ICT sector? These uncertainties inevitably affect investor confidence in the sector.

In the medium and long terms this modernisation will affect in particular the UK labour market and lead to further transformation of forms of working, labour relations and models of work. In this context, the already advanced process of digitalisation will set an important example for other (neo)liberal economies and welfare states. Education policy represents at best only a medium term solution to the problems arising from transformation. Over the long term other, much broader structural changes will have to be discussed, which will also seek to detach work from social security coverage. Whether, for example, the often mentioned unconditional basic income – above the subsistence level – could be a sustainable solution here must be subject to more detailed empirical research.

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