The economic impact of Basic Digital Skills and inclusion in the UK

A report for Tinder Foundation and GO ON UK

November 2015

Cebr

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London, November 2015

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Foreword

Two years ago, we commissioned the *A leading digital nation by 2020* report which, for the first time, set out the cost of getting everyone in the UK online. The report has been instrumental in helping us, and other partners in the sector, to make the argument for further investment in digital inclusion. In the two years that have followed, it's become clear that not only do we need to know the cost of reaching a 100% skilled nation, but we also need to be able to clearly measure the value this will translate into - for individuals, and for the UK economy as a whole.

And, as predicted, the benefits are huge. In this new report, in terms of productivity, there is a benefit of £358 million for individuals, and £243 million for government in additional revenue. The cost savings that government will realise from tax receipts and NHS savings alone will mean the investment will pay for itself. And this is on top of the huge social benefits to individuals of Basic Digital Skills, from reduced isolation through to cost savings (£143 per person, per year), and time savings (30 minutes per person per transaction).

Digital is bringing about a new industrial revolution, and all jobs and workplaces are now underpinned by digital technology. This means it's vital that we can provide people with the skills they need to both find employment, and to use digital technology on a day to day basis in their work, leading to major rewards not only for individuals, but also for national productivity. We strongly believe the UK government needs to set out a bold ambition of reaching a 100% digitally skilled nation, to ensure we're not left behind as other nations make huge strides towards the same goal. The quicker we get there, the bigger the prize for the UK and our global competitiveness, so it's now vital that we can accelerate current programmes, and make a significant financial and strategic commitment to reaching this milestone.

Government recently announced they would introduce a Universal Service Obligation pledge for broadband speeds of 10mbps, which is an important step forward but doesn't go far enough. We know from our work that access to connectivity alone doesn't solve digital exclusion. For the Government to get the maximum value from its investment in broadband, it must ensure that everyone in the UK can benefit from it. Training for those that need it, with a clear focus on the hardest to reach groups, needs to sit alongside universal access to the internet, to ensure everyone can firstly develop, and then make use of, Basic Digital Skills.

We need clear and committed leadership from government, with a cross-departmental digital inclusion strategy backed up by a clear action plan and financial investment. This should be supported by a commitment from the private sector to upskill staff and customers, and to provide offers and services to help everyone get access to the internet at home, and the voluntary sector, who are uniquely placed to support the hardest-to-reach.

So, here's the report. But what's most important is what comes next. This report provides a clear rationale for investment - so the question is no longer about whether we can afford to get everyone in the UK online, but whether we can afford not to.

Helen Milner
Chief Executive, Tinder Foundation

Rachel Neaman
Chief Executive, Go ON UK

Executive Summary

- This report presents the results of a study on the costs and associated benefits of equipping 100% of the UK population with Basic Digital Skills. The purpose of the study was to establish the likely investment required in order to achieve a fully digital society and to estimate the benefits that will result, for individuals, government and society as a result of the initiative.
- The impetus for examining this issue is clear. A recent study from Go ON UK in association with Lloyds Banking Group which was prepared by Ipsos MORI, estimated that 23% of the UK population lack at least one Basic Digital Skill, equivalent to an estimated **12.6 million**[1] **of the adult UK population do not have Basic Digital Skills**. This digitally excluded section of society is missing out on a wide range of benefits that the majority of the population are already enjoying.
- Over time, a number of people without digital skills will acquire these skills naturally through the course of their everyday working lives. However, without taking action, a large group will remain digitally excluded well into the future. Based on an analysis of recent trends, it **is estimated that 7.9 million people will still remain without digital skills by 2025**.

Benefits of Basic Digital Skills to the UK economy

- Digital skills are important not just for individuals but also for the wider economy. They boost the productivity of people in work, help improve the chances of unemployed people to find jobs and increase the population to whom government and NHS services can be provided digitally.
- People who acquire digital skills can benefit through the wider choice and lower prices available when shopping online. They also benefit from being able to use the internet to stay connected to family and friends which helps to reduce isolation in the community, particularly for older people who are most likely to experience such isolation.
- To understand the benefits to individuals and to the Government from an investment programme to equip 100% of the population with digital skills, we have carried out an analysis to calculate the cumulative benefits over the period 2016 to 2025. Six main channels have been identified through which these benefits are realised:
- **Earnings benefits** – academic research shows that people in work who acquire digital skills achieve a rise in earnings of between 3% and 10%. Applying these estimates to the population without Basic Digital skills that are in employment, **by 2025 it is estimated that these benefits would amount to** increased net earnings of **£358 million per year** (see column 2025 in Table 1) **for individuals, equivalent to a £376 increase in net earnings per trained individual per year. In addition, the government is estimated to see £243 million per year** in the form of higher income tax and national insurance (NI) receipts**.**
- **Employability benefits** – evidence shows that having digital skills helps improve the likelihood that a person who is unemployed can find a job. It also encourages people who are inactive to start looking for work. Finding work provides an earnings boost to individuals, and it also means the Government receives more tax revenue and needs to spend less on job seekers allowance benefits, resulting in a saving to the Government. **By 2025, it is estimated these benefits will amount to £204 million per year** (see column 2025 in Table 1) **in net earnings and £79 million per year to the Government in the form of Jobseekers Allowance (JSA) savings and increased income tax and NI receipts.**
- **Retail transaction benefits -** evidence shows that shopping online saves individuals on average 13% compared to if they were to shop in-store, equivalent to £143 per person per

[1] This figure is based on June 2015 release of ONS mid-year population estimates from 2014. When the percentage is applied to the estimates for 2015, this rises to 12.8m

year. Applying these estimates to the number of persons requiring training each year and varying by average spending for different age group, we estimate **transaction benefits to individuals of £796 million per year by 2025** (see column 2025 in Table 1)**.**

- **Communication benefits -** A survey by UK online centres in 2009 found that after having attained Basic Digital Skills, they felt they were able to connect and communicate with their community, friends and families 14% more frequently. As a result of increased communication, we anticipate these individuals will spend more on recreation and cultural activities with their family, friends and the community. We estimate the **aggregate additional expenditure on recreational and cultural activities to amount to £415 million per year by 2025** (see column 2025 in Table 1).

- **Time savings -** By accessing government services and online banking transactions online, individuals can save an average of 30 minutes per transaction. The leisure time unnecessarily spent by individuals accessing government and banking services in person has a value which can be presented in monetary terms. Our calculations show that these **time savings would provide benefits amounting to £1.5 billion per year by 2025** (see column 2025 in Table 1).

- **NHS cost savings** - Tinder Foundations' NHS Widening Digital Participation programme found a third (34%) of those learning Basic Digital Skills made fewer visits to a doctor after learning about online health resources such as NHS Choices. Assuming this proportion of individuals reduce their annual number of visits to the GP by one, based on a cost to the NHS of £45 per GP visit, **NHS savings would amount to £121 million a year by 2025** (see column 2025 in Table 1).

Investment required to equip the nation with Basic Digital Skills

- Training an estimated **788,000 number of people each year** with Basic Digital Skills would require a substantial financial commitment. We have carried out an analysis to calculate the likely size of this investment over the ten year appraisal period.

- An analysis was carried out using detailed information provided by digital skills centres on the actual operational and capital start-up costs associated with Basic Digital Skills training. These **tuition costs vary from £44 to £351 per learner depending on the age of the learner, their disability status, and previous Basic Digital Skills training**. We estimate that an **investment with a present value of £1.31 billion** (see Total column in Table 1) **is required over the ten year period (2016 to 2025)** in order to equip 100% of the population with Basic Digital Skills.

- In order for learners to be able to fully utilise their newly acquired skills, they will require access to an internet enabled device which may involve the purchase of a smartphone, tablet or laptop computer. Smartphones are low cost, and an easy way to access the internet, thereby facilitating individuals to benefit from Basic Digital Skills. Smartphone ownership is focussed on as the minimum criterion for being able to reap the benefits of digital skills. Based on the likely trajectory of the price of smartphones and the projected smartphone ownership rate in households where individuals lack digital skills, we estimate that **the costs to individuals from purchasing internet enabled devices has a present value of approximately £336 million over the ten year period** (see Total column in Table 1).

- Combining these estimates of training costs and the costs of purchasing digital devices, we estimate that the **present value of the required investment equates to £1.65 billion** (2014 prices) over the ten year period.

Comparing costs and benefits

- In order to determine whether investing in Basic Digital Skills training represents a sound investment, it is necessary to use appropriate economic appraisal metrics such as Net Present Value (NPV) and Cost-Benefit Ratio.

- Based on the specific costs and benefits to individuals and the Government described above, **we estimate an NPV of £14.3 billion** (Table 1) **for this investment and a cost-benefit ratio of 9.7. This implies a benefit of almost £10 for every £1 invested.**
- These findings suggest that investing to equip 100% of the population with digital skills represents a good investment not just for society but also for Government. In present value terms, the accumulative benefits over ten years of **increased tax receipts and lower jobseekers' allowance payments amount to £1.4 billion, whilst NHS primary care savings total £0.5 billion, together accounting for £1.9 billion in benefits for the government** (see Total column in Table 1).

Conclusions

- Overall, this study concludes that the benefits to training those without Basic Digital Skills far outweigh the costs involved, and such an investment would generate a substantial return to society and to government. In fact, the study shows that the boost in tax receipts and NHS savings alone exceed the size of the investment required.
- Investing in upskilling the population should be viewed by policymakers as an investment in the UK's future economic prosperity. This study demonstrates that the government, businesses, and individuals are at risk of losing out substantially if we miss this opportunity to invest in digital inclusion.
- For the Government, investing in the nation's digital skills broadens the population that is capable of availing of digital initiatives designed to save the Government money. This means that a strategy to invest in digital skills could generate substantial synergies with other initiatives such as NHS services, the national broadband delivery programme and digitising Government services.
- In 2012, government's 'digital by default' strategy was launched with the intention of migrating some high-volume use public services to the Internet. This programme has been progressively rolled out, with services such as electoral registration and passport renewal already migrated. Government's 2012 Digital Efficiency[2] report estimated that between £1.7 billion and £1.8 billion[3] could be realised as total annual savings to the government and to the users of its services. These benefits have not been included in the cost-benefit analysis as the benefits reported in the Digital Efficiency Report would accrue without investment in digital skills and therefore are not additional.
- However, under a scenario whereby the Government was to invest in a Basic Digital Skills programme, which is studied in this report, it would bring forward the timing and increase the size of the savings related to the Government's digital efficiency strategy. Therefore support from the Government to **invest in a Basic Digital Skills training programme would accelerate the benefits of the Government's digital efficiency strategy.**

[2] Cabinet Office and Government Digital Service, 2012, 'Digital Efficiency Report'.

- For individuals, having digital skills represents a whole host of potential life-changing benefits including the possibility of finding employment more easily and reducing social exclusion. Such an initiative would therefore have a positive impact not just on the economic performance of the UK, but also on the social well-being of the nation.

Table 1: Summary[4] of the cost and benefits of the proposed investment programme, £ million (2014 prices) [5]

		Year 1	Year 10	Total (present value)
		2016	**2025**	
Investment costs	**Operating cost**	-153	-153	-1,269
	Capital cost	-5	-5	-42
User costs	**User cost of digital devices**	-77	-14	-336
User benefits	**Net earnings benefits**	35	358	1,546
	Net employment benefits	18	204	854
	Transaction benefits	80	796	3,453
	Communication benefits	42	415	1,801
	Time savings	139	1,519	6,392
Gov. benefits	**NHS cost savings**	12	121	523
	Income tax and NI receipts, and JSA benefit reduction	31	323	1,392
	Discount factor @ 3.5%	0.97	0.71	
	Present value	**118**	**2,526**	**14,314**

Source: Cebr analysis

[4] Please find the complete table of results on page 43 of this report.

[5] The benefits estimated in Section 4 are cumulative benefits over 10 years, which is equivalent to the figures under the column heading "Year 10" or "2025". The NPV is the sum of the discounted cash flows over the period of the entire investment. This criterion is simply based on whether the sum of discounted benefits exceeds the sum of discounted costs, which are presented under the "Total (present value) column.

1. Introduction and background

This report presents a comprehensive study of the costs and associated benefits of equipping 100% of the UK population with Basic Digital Skills. The purpose of this study is to establish the likely investment required in order to achieve a fully digital society and to estimate the benefits that will go to individuals and society as a result of this initiative. The study was commissioned by Tinder Foundation and Go ON UK.

The impetus for examining this issue is clear. According to a recent survey[6], 12.6 million[7] people or 23% of the UK population was estimated to not have Basic Digital Skills. This group that remains digitally excluded is missing out on a wide range of benefits that the majority of the population are already enjoying. In the digital age, being able to use digital technology is fast becoming an essential skill, and those that are not equipped are becoming increasingly marginalised in society and in employment.

There already exists a skill bias in the labour market towards technologically literate persons and this will only increase as digital skills becomes a basic requirement for an increasing array of jobs. In a previous era, being able to read and write was the minimum standard for education. It is well-recognised that in today's world, having the basic ability to navigate the internet is essential to both individuals and businesses, in terms of obtaining information and being able to engage with communities, suppliers, clients or customers. Helping individuals who lack these skills to attain them will benefit not just the individual employees and customers, but also businesses and the wider UK economy.

The dramatic advancement of internet and digital communication technologies provide benefits in both time and monetary terms for people who use them, making society more productive, lowering the cost and widening the range of products available to consumers, and making it less costly and time-consuming to access Government and banking services.

For these various reasons, it is therefore important to have a clear picture on what the benefits would be to society if we are to make the investment in having a digitally included society and whether such an investment can be justified given the costs involved.

1.1. What are Basic Digital Skills?

Go ON UK defines Basic Digital Skills[8] as the minimum skills required for an individual to safely use the internet and access the benefits it has to offer. An individual with Basic Digital Skills is expected to have the capabilities to undertake the following tasks:

- **Managing information**: having the skills to use a search engine to find information, search for deals on comparison websites, able to bookmark useful websites and services and store data on a device or in the cloud.

- **Communicating**: the individual is able to keep in touch with family and friends using emails, instant messaging, video calls and social media. This includes the ability for an individual to post comments on forums, connect with online communities and leave feedback e.g. on shopping websites and for service providers about purchases or experiences they've had.

- **Transacting:** the ability to undertake financial transactions, such as completing a Universal Credit application, ordering shopping, booking travel, managing bank

[6] Ipsos MORI/ Go ON UK Basic Digital Skills UK Report 2015

[7] The equivalent figure for 2015 is 12.8 million of the UK adult population

[8] This definition was developed by Go ON UK in collaboration with the London School of Economics (LSE), Citizens Online, the London Business School and Tinder Foundation. Further information can be found here: http://www.go-on.co.uk/basic-digital-skills-table/

accounts, using digital government services and understanding how to buy and sell on the virtual marketplace.

- **Problem-solving:** The individual should be confident to solve problems using digital skills such as teaching themselves simple tasks using video lessons, using feedback from other internet users to solve a common problem and accessing support services e.g. 'live chat'.

- **Creating:** having the skills to create basic digital content. For example, creating a social media post, drafting a text document, creating and sharing photo albums and providing feedback to online communities.

An individual who can successfully undertake the above tasks is considered to have Basic Digital Skills. In the remainder of this report, any reference to Basic Digital Skills refers specifically to the above definition developed by Go ON UK and its partners.

1.2. Basic Digital Skills – the current picture

Various estimates have been produced previously on the number of persons without digital skills in the UK. The ONS Internet Users 2015 publication shows that 13% of the UK adult population (7 million) have never used or are infrequent users. Since the ONS began measuring internet usage in 2011, there has been a clear downward trend – the percentage of adults who have never used the internet has decreased from 17% in Q1 2011 to 11% in Q1 2015. This suggests that over time, the number of persons without digital skills will also fall, as individuals acquire skills in their everyday life.

The Ipsos MORI survey[9] conducted in 2013, estimated that there are 11 million people in the UK without Basic Digital Skills. A 2014 study by Catherine McDonald[10] used the same ONS data to proxy a person without digital skills as someone who is an irregular internet user or has never used the internet. Using this definition, it was estimated that without an intervention to provide digital skills training there would still remain 7 million people without digital skills by 2020.

The latest and most comprehensive estimate of the number of people that will require digital skills training has been carried out by Ipsos MORI and Go ON UK. Ipsos MORI was commissioned to carry out a survey on the extent of digital skills amongst the UK population – The Basic Digital Skills Report 2015. This survey represents an adaptation to the Ipsos MORI BBC Digital Capabilities Survey 2013, using a refined definition of digital skills.

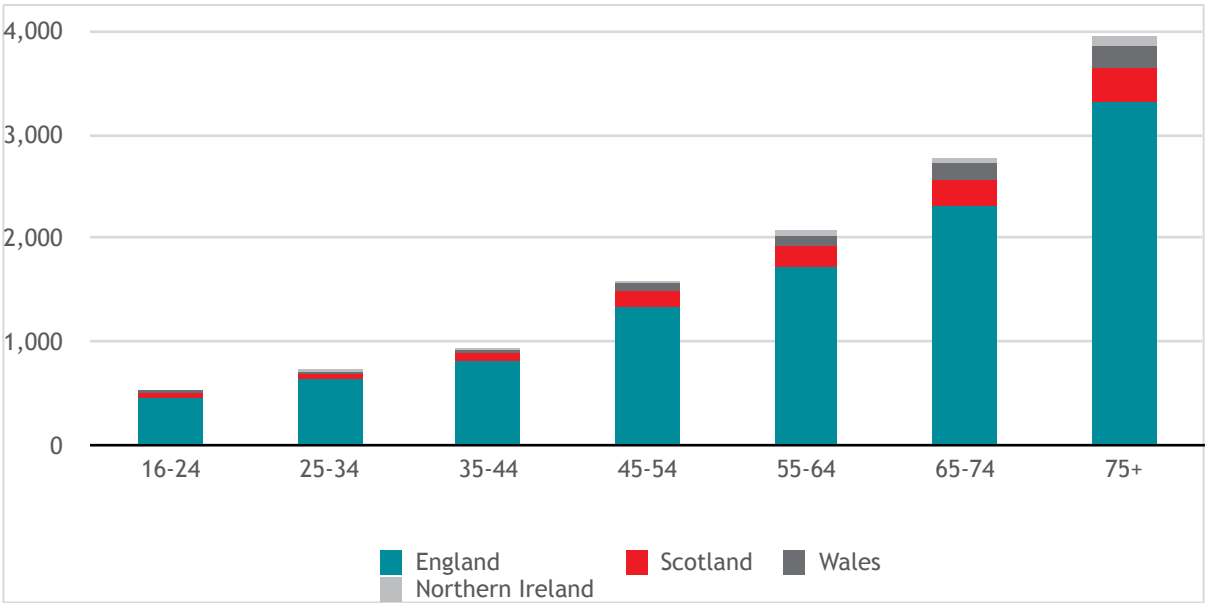
The survey finds that 23% of the UK adult population in 2014 lacks Basic Digital Skills. According to the survey, it is estimated that 12.6 million[11] of the UK adult population do not have Basic Digital Skills. The survey also reveals that there exists a large digital divide between the generations. The population without digital skills is strongly concentrated in older age groups – 54% of all those without digital skills (6.9 million people) are over the age of 65 (see Figure 1).

[9] Ipsos MORI survey 2013: http://downloads.bbc.co.uk/aboutthebbc/insidethebbc/whatwedo/learning/audienceresearch/bbcmedialiteracy_20131023.pdf

[10] Catherine McDonald, 2014, 'A Leading Digital Nation by 2020', Tinder Foundation.

[11] The equivalent figure for 2015 is 12.8 million of the UK adult population

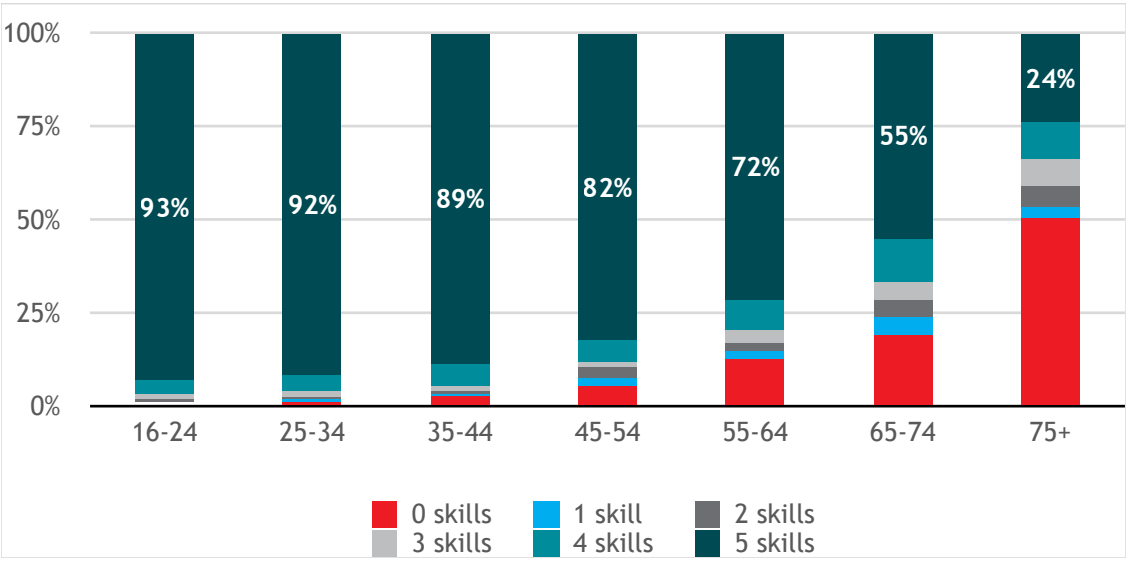
Figure 1: Number of persons lacking at least one digital skill, by age group and nation, 2014, thousands



Source: Go ON UK / Ipsos MORI Basic Digital Skills UK Report 2015, ONS 2012-based sub-national population estimates, Cebr calculations

The digital generational divide becomes even more evident when you examine the breakdown of digital skills within age groups. According to the same survey, only 24% of over 75s in the UK have all five Basic Digital Skills. In contrast, 93% of 16 to 24 year olds have all five Basic Digital Skills. An obvious explanation of this is that younger generations (the so-called digital natives) have grown up with digital technology and are therefore the most likely to have digital skills. By contrast, those in older generations without digital skills may have had limited interaction with digital technology during their working lives, and have therefore not had the opportunity to acquire those skills.

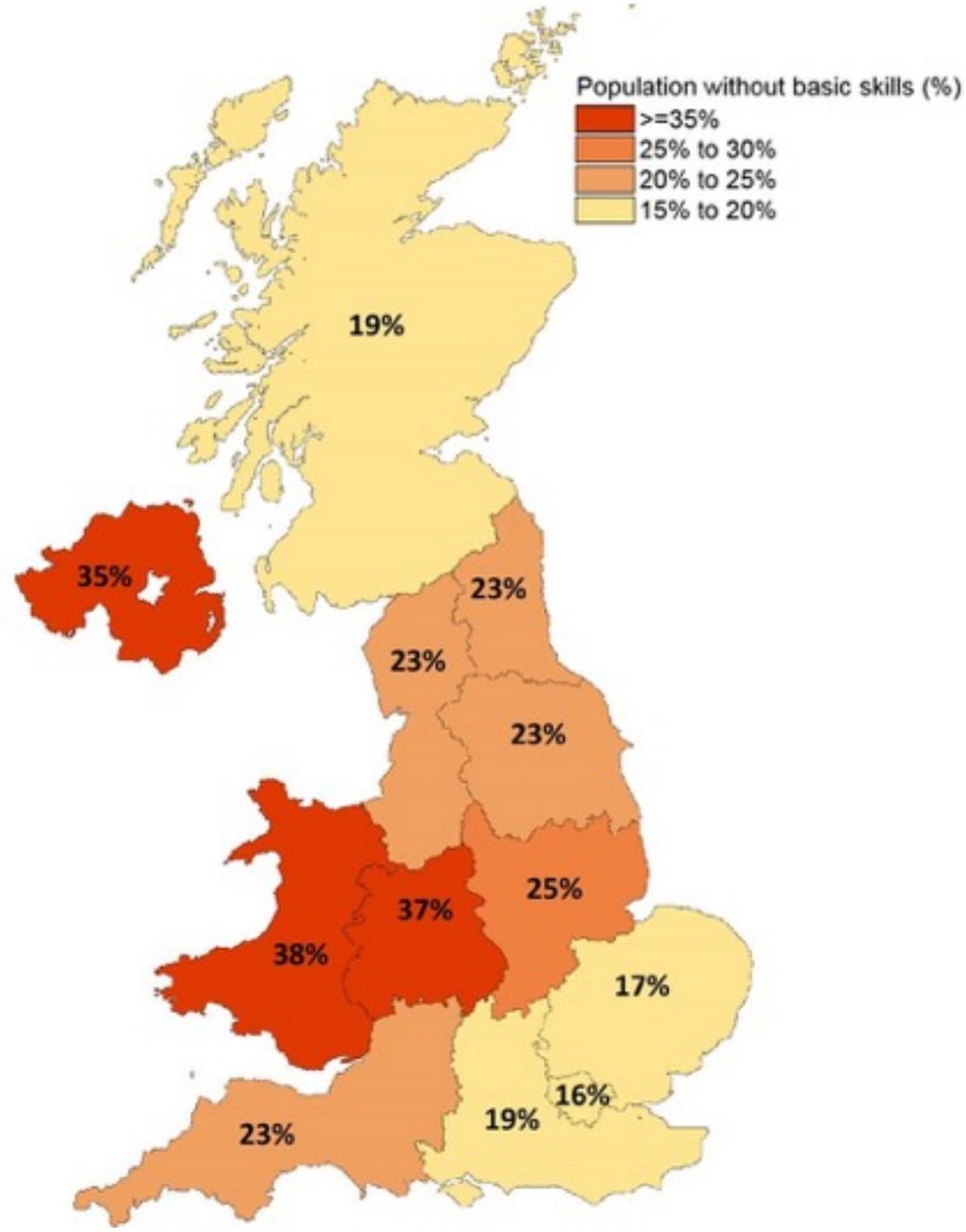
Figure 2: Distribution of digital skills, by age group and number of digital skills possessed



Source: Go ON UK / Ipsos MORI Basic Digital Skills UK Report 2015, Cebr calculations

There also exists large digital skill divides between the regions and nations of the UK. In Northern Ireland and Wales, 35% and 38% of their respective populations do not have at least one Basic Digital Skill. By contrast, in London just 16% of the population do not have at least one Basic Digital Skill (see Figure 3).

Figure 3: Proportion of population lacking at least one Basic Digital Skill, by nation/region



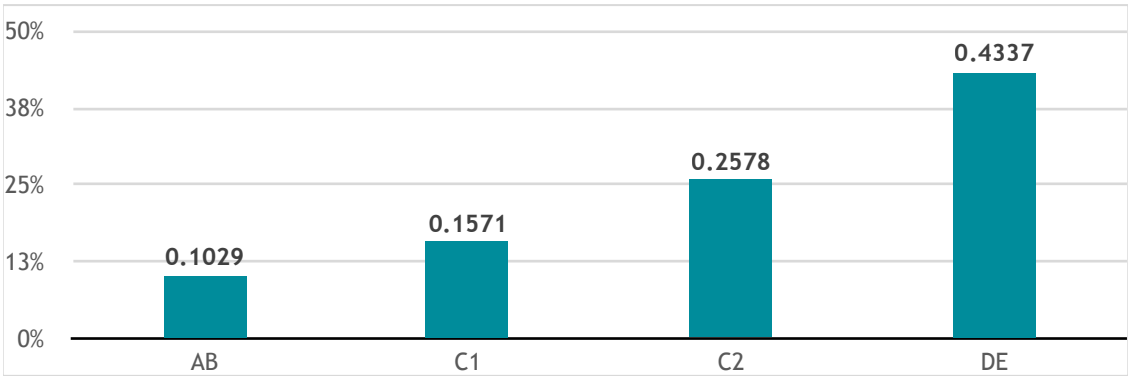
Source: Go ON UK / Ipsos MORI Basic Digital Skills UK Report 2015, Cebr calculations

Amongst the UK's workforce, people without digital skills are more highly concentrated amongst manual skilled, semi-skilled and unskilled occupations. Survey findings presented in Figure 4 show that the proportion of persons without digital skills in the DE social grade[12] is more than three times as high as the AB social grade. The evidence indicates that having Basic Digital Skills tends to correlate with higher skilled occupations. It also points to the important

[12] The social grade classifications relate to standard occupation groups as follows: A: Higher managerial, administrative or professional occupations, B: Intermediate managerial, administrative or professional occupations, C1: Supervisory or clerical and junior managerial, administrative or professional occupations, C2: Skilled manual occupations, D semi-skilled and unskilled manual occupations, E: casual workers, non-working and pensioners

role that providing digital skills can play for low skilled and unemployed workers in terms improving their chances of being able to find and secure suitable employment.

Figure 4: Proportion of population lacking at least one Basic Digital skill, by social grade



Source: Go ON UK / Ipsos MORI Basic Digital Skills UK Report 2015, Cebr calculations

1.3. Purpose and objectives of this study

The objective of this study is to examine the costs and benefits to society in a scenario where an investment was made to equip 100% of the UK adult population with digital skills by 2025.

The goal of achieving 100% digital skills is ambitious, but there exists evidence to suggest that this is a feasible target given that several countries are close to achieving this target.

According to an EU-wide survey of internet usage by individuals[13], the proportion of adults who have never used the internet is close to 0% in several countries. Iceland (1%), Norway (3%) and Denmark (3%), Luxembourg (4%), and the Netherlands (5%) are ahead of the UK (6%) in terms of internet usage amongst the population. Their success suggests that it would be possible for the UK to achieve a similar performance[14].

Currently in the UK, around 100,000 people receive Basic Digital Skills training each year from a number of predominantly volunteer organisations, with a mix of private and Government funding. The number of people trained per year would need to increase substantially in order for the numbers without digital skills to be brought down to negligible levels. Without this initiative, a substantial share of the UK population would remain digitally marginalised well into the future.

This study builds on previous research commissioned by Tinder Foundation and Go ON UK in 2012 which explored the cost of educating 100% of the adult population who do not have Basic Digital skills by 2020[15]. The report concluded that the cost would amount to £875 million over the period.

Other studies have explored the benefits of digital skills in a variety of ways ranging from measuring the social value of digital inclusion to the economic benefits of making the UK a world leader in digitisation. Cebr's contribution to the existing body of research includes:

[13] Eurostat, 2014, 'Survey on ICT (information and communication technology) usage in households and by individuals'.

[14] However, it is acknowledged that even if a digital skills investment programme of this scale was introduced and implemented, in practice it is likely that there would still remain a small proportion of the population that would opt out of digital skills training or be unable to attend. Therefore, the calculations presented in this study should be interpreted as the hypothetical outcomes related to a scenario that may materialise somewhat differently in practice.

[15] Catherine McDonald Consulting, 2014, 'A Leading Digital Nation by 2020: Calculating the cost of delivering online skills for all', Tinder Foundation.

- Provision of a detailed estimate of the number of people that would need digital skills training in order for 100% of the UK population to have basic digital skills by 2025, based on a comprehensive nationally-representative survey;
- A different approach of estimating the investment required over a ten year period in order to provide training to the necessary number of people. The information required to calculate these costs is sourced from a number of existing digital skills centres and includes the capital cost involved in setup and operation of centres;
- Calculating and consolidating the various benefits that have been cited in previous studies, and attributing those benefits to the groups to which they would accrue;
- Cost-benefit analysis to assess whether the proposed investment in digital skills is worthwhile from the perspective of society and government, involving the monetisation of as many of the costs and benefits of the proposed investment that it was feasible to achieve.

The purpose of this research is therefore to unify the various studies that cover different elements of the economic value of digital inclusion, compare these benefits to the costs involved in equipping individuals with a basic level of digital education and provide a robust estimate of the net present value and cost-benefit ratio that such an investment would deliver for the UK economy.

1.4. Limitations of the study

There are several limitations and aspects that were beyond the scope of consideration of this report. These are summarised here:

- *The funding sources of any potential Basic Digital Skills programme:* currently, centres providing Basic Digital Skills training receive funding from a variety of sources, with the majority coming from Government departments. A future digital skills training programme would require substantial financial support. The potential source of this funding is beyond the scope of this study.
- *The appraisal period*: the time period for which the costs and benefits are calculated – is restricted to 10 years. In practice, the benefits associated with gaining Basic Digital Skills will accrue to the learner well beyond this ten year period. However, given that the population requiring digital skills training is heavily concentrated in older age groups, it is prudent and conservative to restrict the measurement of benefits to the period of the investment programme.
- *Benefits to businesses*: we do not consider the wider benefits to businesses of employees gaining Basic Digital Skills. Although we capture the potential increase in employees' productivity through their boost in earnings, we do not go so far as to examine what this means for businesses, in terms of revenue, costs, investment and innovation. Rather, we have focused on the sources of benefit that have the greatest potential.

1.5. Structure of the report

This report is structured as follows:

- **Section 2: The importance of digital skills** - Sets out the importance of investing in digital skills in the context of recent developments in the UK economy.
- **Section 3: Investment required to achieve 100% population with Basic Digital Skills** – Presents estimates on the number of people that will require digital skills in order to reach the objective of 100% of the population by 2025 and estimates on the overall investment required.
- **Section 4: The economic benefits of Basic Digital Skills to the UK economy** – Presents the estimated monetised benefits of achieving a 100% population with Basic Digital Skills to individuals and society.

- **Section 5: Comparing the costs and benefits of investing in digital skills** – Compares the overall costs and benefits in monetary terms adjusted for the time value of money, in order to determine whether the benefits related to equipping 100% of the population with Basic Digital Skills justifies the investment.
- **Section 6: Conclusions and policy implications** – Presents the conclusions on the findings of the research.

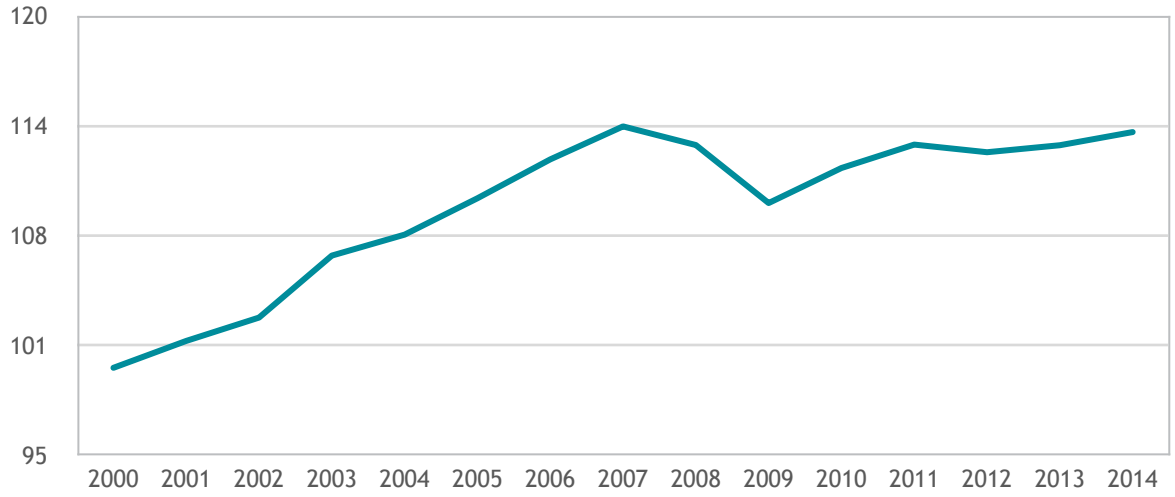
2. The importance of digital skills

This section outlines the significance of having a digitally literate population to the UK economy. We begin by illustrating the importance of digital skills to driving productivity in the economy. We then move on to demonstrate the value of digital skills to boosting employment, before outlining the growing influence the internet has on sales in the UK retail sector. Finally, this section describes the potential cost and efficiency savings the Government stands to gain from providing access to public services through the internet.

2.1. Productivity

The challenge to boost UK productivity growth has been identified by the Chancellor as one of the Government's most important economic challenges for the next five years. Basic Digital Skills are particularly important because they are intrinsic to many jobs in the services sectors - which make up 75% of the UK economy. Equipping individuals with Basic Digital Skills not only improves their employability, but also improves their productivity in their existing jobs.

Figure 5: UK labour productivity (GVA[16] per employee) from 2000 to 2014 (index 2000=100)



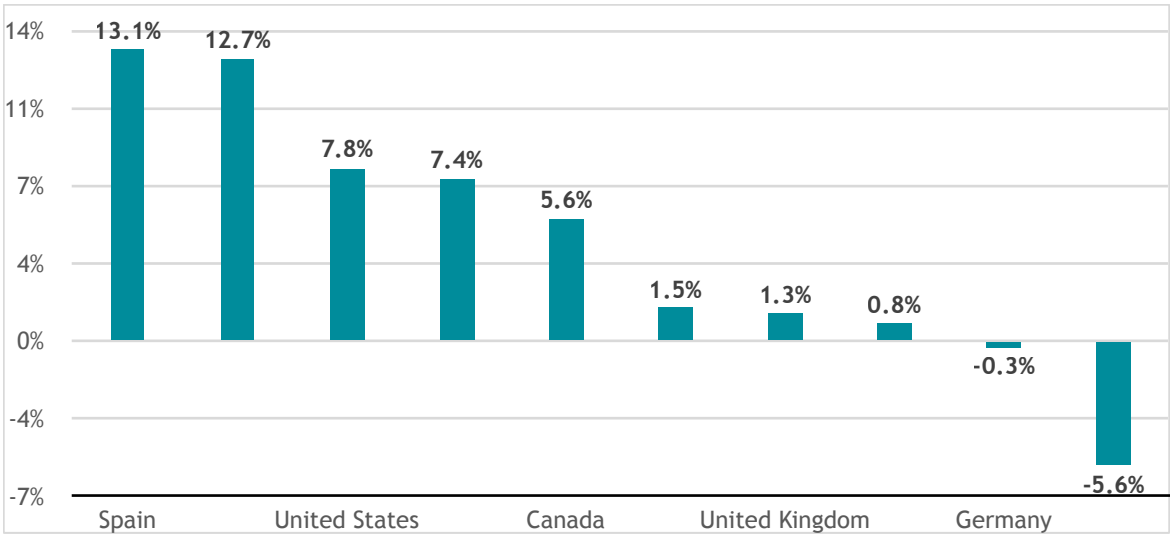
Source: Cebr analysis

Labour productivity[17] has been recovering since the financial crisis, and has recovered in 2014 to its pre-crisis high observed in 2007 (Figure 5). The UK needs to maintain strong productivity growth in order to remain competitive in the international marketplace and to achieve economic growth. Recent performance has been poor with the UK ranked 7th out of the 10 largest OECD economies in terms of productivity growth since 2008 (see Figure 6).

[16] Gross value added (GVA) is a measure of output similar to GDP, but which excludes taxes and subsidies on products. Since these taxes and subsidies are calculated at the UK level, GVA provides a measure of output for activity occurring at a lower level than the UK as a whole, such as regions and industries.

[17] Labour productivity, defined as the average value added per worker, is calculated as the total UK Gross Value Added (GVA) divided by the total number of individuals in employment in the same year.

Figure 6: Productivity growth (GDP per person employed) between Q1 2008 and Q2 2015, 10 largest OECD economies



Source: OECD, Cebr calculations

According to a study by the Centre for Education and Economics[18], the average wage premium associated with having digital skills is between three and 10% of annual earnings. The earnings of employees are normally strongly related to their productivity – employers are willing to pay more to people who are more productive, because they stand to benefit from increased output. This implies that providing training for the 926,000 people currently in work without Basic Digital Skills could provide a substantial boost to productivity levels in the UK economy.

2.2. Employability and employment

When individuals do not have digital skills, it can mean underutilisation of individuals' unique talents and experience, and marginalisation in the labour market. Digitally skilling the nation can produce substantial benefits in terms of increasing the employability of individuals, by improving the quality of the UK workforce's skill levels and, all else being equal, reducing the number of people who are unemployed and underemployed.

Over recent years, the internet has become a vital tool for job seekers. The internet facilitates the low-cost and efficient exchange of information between employers and those seeking employment, whilst simultaneously reducing the time and money spent in searching and applying for job opportunities.[19] This allows for more intensive job-search activity and increases the chances that employers will find the right employee.

In 2013, almost half (49%) of those with access to the internet had used it to search for job opportunities (Figure 7). This proportion has increased by eight percentage points between 2013 and 2014. The greatest rise is observed amongst those in the 35-44 age bracket, with the proportion of individuals using the internet to search for jobs rising by 18% in the same period.

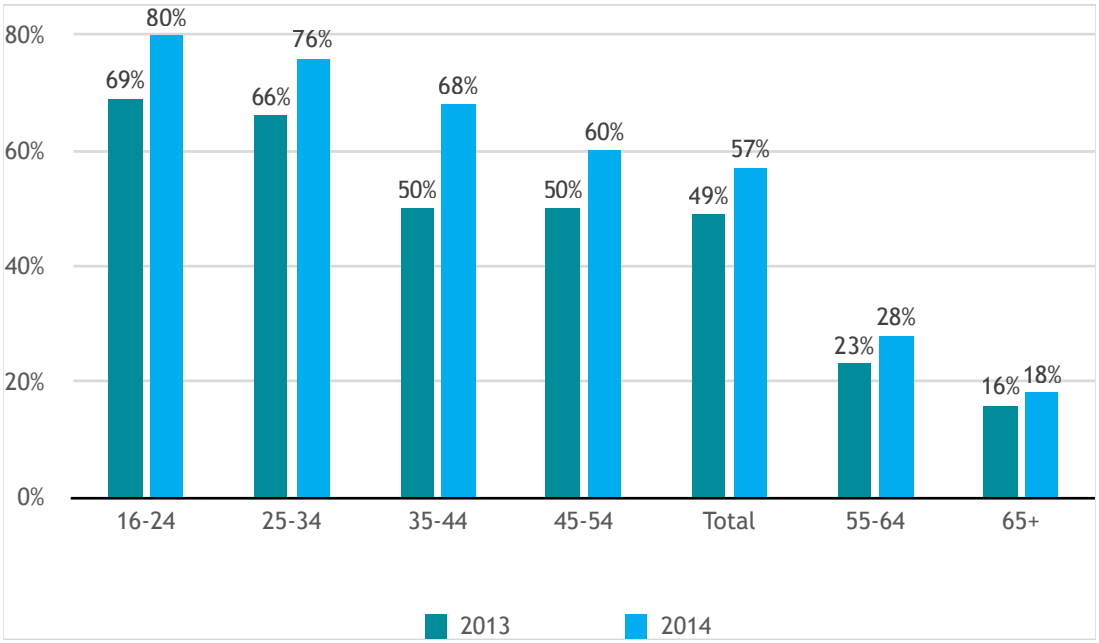
On the other end of the age spectrum - amongst individuals aged 55 and above - a substantially smaller proportion of people have used the internet for the same purposes, compared to the national average. While it is noted that a smaller proportion of this age group is in work or actively looking for work, current demographic changes indicate that more people will be working past the age of 65 in the future. Increased life expectancy, smaller pension pots and larger mortgages mean that it will be necessary for a higher number of older people to continue to work past retirement age. Equipping older age groups with digital skills,

[18]Dolton and P. Pelkonen, (2007), 'The Impact of Computer Use, Computer Skills and Computer Use Intensity: Evidence from WERS 2004', Centre for the Economics of Education.

[19] A. Green, M. Hoyos, Y. Li and D. Owen, (2011), 'Job Search Study: Literature review and analysis of the Labour Force Survey'.

particularly skills related to job searching, will help improve the success of those looking for employment and thus their overall prosperity in old age.

Figure 7: Individuals using the internet to search for job opportunities (% of those that use the internet), 2013 and 2014



Source: Ofcom Adult Media Literacy Tracker 2013 and 2014

As the internet becomes increasingly pervasive as a tool used in searching for jobs and for recruitment, there are concerns about the 'digital divide' – i.e. the gap between those with Basic Digital Skills and access to the internet and those without. Recent research suggests that this gap will continue to widen as digital skills become even more embedded into the way we work. For example:

- Research by Tinder Foundation[20] found that 90% of all new jobs require digital skills, with almost three-quarters (72%) of employers revealing that they would not even interview a candidate who does not possess basic computer skills.
- The proportion of people using IT in their job is now at 77%, with an estimated 22m people using technology at work; [21]
- Furthermore, employers report that the vast majority of positions that they recruit for (92%) require applicants to hold at least basic level IT user skills.[22]
- Amongst unemployed individuals, three-quarters of internet users felt confident that they had the right skills to find a new job compared to only half of unemployed non-users (Freshminds/UK online centres, 2009).

This evidence suggests that the initiative to invest in equipping 100% of the UK population with Basic Digital Skills, is an important element for future-proofing the UK's labour force for the inevitable expansion of technology in the workplace and in our daily lives.

2.3. Financial savings from online retail

There are currently 5.9 million people in the UK who have never used the internet and 1.1 million that use it occasionally. This represents a substantial group of consumers that are not

[20] Tinder Foundation: http://www.tinderfoundation.org/our-thinking/research-publications/online-jobs-report

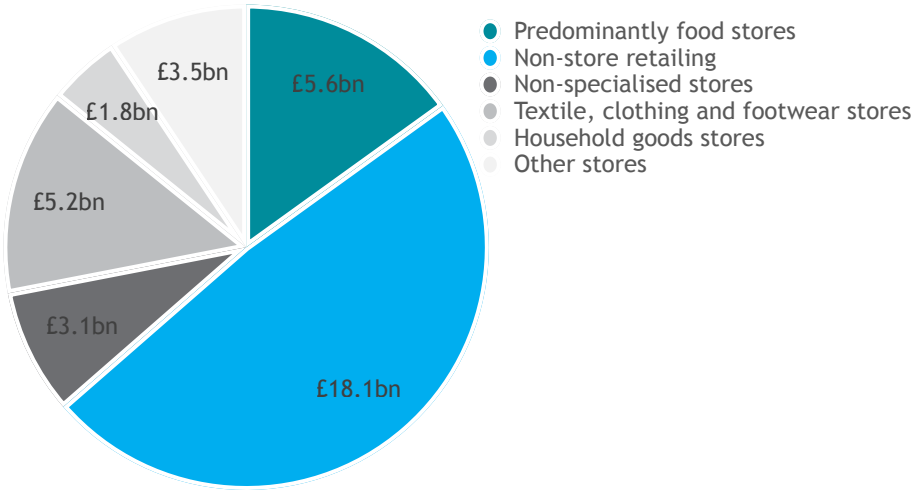
[21] Digital Britain: Creating Skills for the Digital Economy, submission to Lord Carter by eSkills UK and Skillset, 2009

[22] E-skills UK 2009 employer survey

able to enjoy the convenience benefits or the monetary savings yielded from shopping online. Equipping all of the UK population with Basic Digital Skills could stimulate further expansion in the online retail sector. While it can be argued that every online sale is a lost sale to the high street, the new ability to shop online (having acquired basic digital skills) can also be expected to unlock some latent demand, thus boosting a retail sector that employs 10% of the UK workforce but has suffered recently from lacklustre consumer confidence and shifts in consumer spending habits.

In 2014, internet sales accounted for 11.2% of all retail spending (excluding automotive fuel), representing an increase from the 10.4% recorded in 2013 (ONS Retail Sales 2015). In monetary terms, the value of internet retail sales amounted to £37.4 billion in 2014, with the largest proportion of sales experienced by non-store retailing i.e. internet and mail order only retailers (Figure 8).

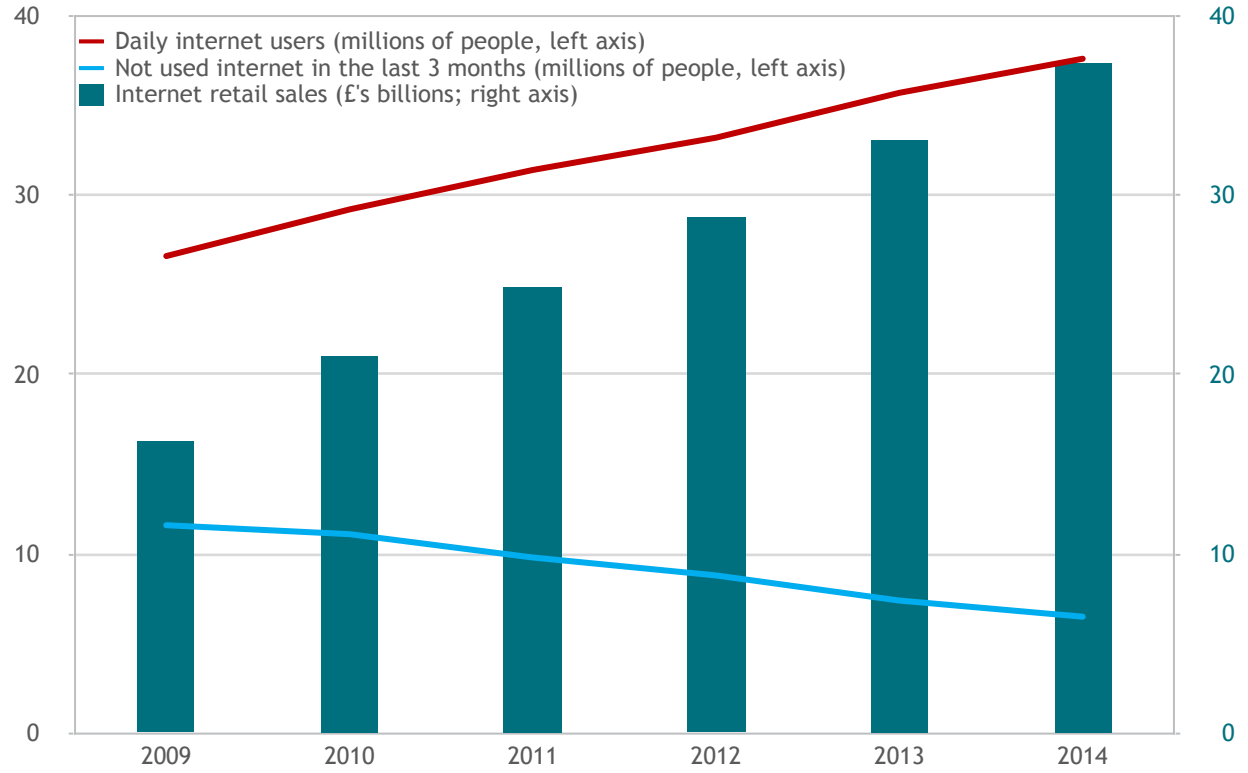
Figure 8: Internet retail sales by retail segments in 2014, £ billion



Source: ONS Retail Sales, August 2015

Annual average weekly spending online in 2014 reached £719 million, up from £342 million in 2009, representing a 110% rise over five years. Annual average weekly spending in 2014 was 11.8% higher compared to 2013. The growth in popularity of online shopping is closely linked to the number of people using the internet regularly. Figure 9 shows how growth in annual internet sales have closely tracked the number of daily internet users. The data suggests that increasing the number of regular internet users in the UK through investing in digital skills, can lead to growth in the overall online retail market, which would drive the nation's retail sector.

Figure 9: Correlation between internet retail sales and the number of internet users in the UK, 2009 - 2014



Source: ONS, Cebr analysis

2.4. Online transacting with government

Government spends billions of pounds each year in providing 'in-person', telephone and postal-based services that could be replaced by online solutions – it is estimated that digital transactions are 20 times cheaper than by phone, 30 times cheaper than by post and as much as 50 times cheaper than by face-to-face meetings[23]. The Government's 2012 Digital Efficiency report estimated that between £1.7 billion and £1.8 billion could be realised as total annual savings to the government and to the users of its services. The report stated that savings could be made from greater digitisation of transactions whilst maintaining, and ultimately improving service quality[24]. Increasing the proportion of the population with Basic Digital Skills would help to realise these savings, and help to reduce the strain on the public finances.

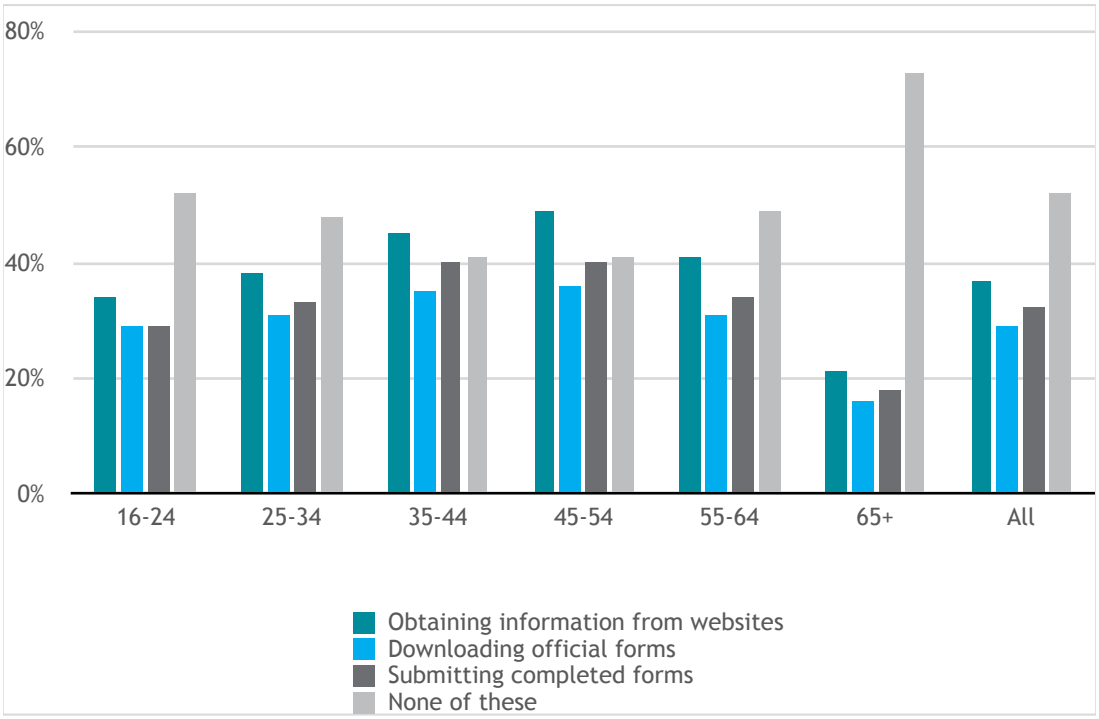
In 2012, government's 'digital by default' strategy was launched with the intention of migrating some high-volume use public services to the Internet. This programme has been progressively rolled out, with services such as electoral registration and passport renewal already migrated. Concerns regarding the impact of the relocation of services online for people who are not currently online has meant that traditional public service delivery is likely to remain available for the foreseeable future.

Statistics from the ONS show that in 2014 the most common reason for accessing a public authority or service website was to obtain information (see Figure 10). Adults in the 45-54 age group had the highest level of interaction with public authorities or services with almost half (49%) obtaining information from websites, 36% downloading official forms and 40% submitting official forms. In contrast, adults in the over 65 age group had much lower levels of interaction with Government websites.

[23] Cabinet Office and Government Digital Service, 2012, 'Digital Efficiency Report'.

[24] Government Digital Service (2012) "Digital Efficiency Report", accessed: [https://www.gov.uk/government/publications/digital-efficiency-report/digital-efficiency-report

Figure 10: Reasons for using the internet to interact with public authorities or services, by age group, 2014



Source: ONS Internet Access - Households and Individuals 2014

Encouraging people to access public services online more frequently will not only deliver substantial savings to government in customer support and administrative spending, it will also provide a benefit to users who can reduce the time they need to spend interacting with public authorities and services through traditional means, freeing up leisure time for other purposes. Equipping more of the population with digital skills grows the user base for such online services, increasing the potential savings that can be delivered for both government and society.

3. Investment required to achieve 100% population with Basic Digital Skills

This section presents our estimates on the number of people that will need to be trained over a ten year period in order to achieve 100% population with Basic Digital Skills by 2025 and the associated investment required to achieve this goal.

3.1. How many people will require basic skills training?

With digital technology becoming an increasingly important part of our daily lives, the number of internet users has increased across the population. In 2006, 18.5 million adults in the UK did not use the internet regularly. By 2015, that number had fallen to 6.5 million. However, the rate at which the number of internet users is increasing has slowed and will continue to do so. A large proportion of the population remains with only limited or no Basic Digital Skills. These people are likely to remain digitally marginalised – they are unable to enjoy the benefits that access to the internet, and being able to carry out basic tasks online can provide to individuals.

Ipsos MORI[25] estimates that 12.6 million[26] people in the UK did not have at least one Basic Digital skill. Based on demographic trends and trends in internet use, we project that this number will fall to 7.9 million by 2025. This means that if we do not take action to train more of the population in digital skills, a large number of people will still remain digitally marginalised well into the 2030s. To address this issue, we have carried out an analysis to examine the likely size of investment required in order to achieve 100% of the population with Basic Digital Skills by 2025.

A first step in this analysis is to establish the number of people that will require basic skills training over the period. Cebr first carried out an analysis to establish the baseline number of persons without at least one digital skill over the ten year period between 2016 and 2025 in the 'base case' scenario where no training intervention occurred.

The projections were calculated using the following data sources:

- The Ipsos MORI / Go ON UK Basic Skills UK Report 2015 survey was used to establish the existing size of the population without at least one digital skill;
- ONS Internet Users 2015 statistics, which shows that the rate of change of non-internet users (a proxy for the acquisition of digital skills) has declined over time. Cebr used these statistics to model how the baseline population would decline up to 2025, across different age groups;
- ONS population projections by age group, which, combined with the above sources, were used to develop forecasts of the numbers of persons expected not to have digital skills by 2025;

It was assumed that existing digital skills training activities in the UK are not included within the projections of persons that will need training.

The analysis reveals that over the ten year period between 2016 and 2025, an additional 4.9 million people are expected to acquire all five basic skills without intervention. Of this total, the largest beneficiary age group is people between the ages of 65 and 74, with a projected 1.4 million individuals in this age category acquiring all five skills over the time period.

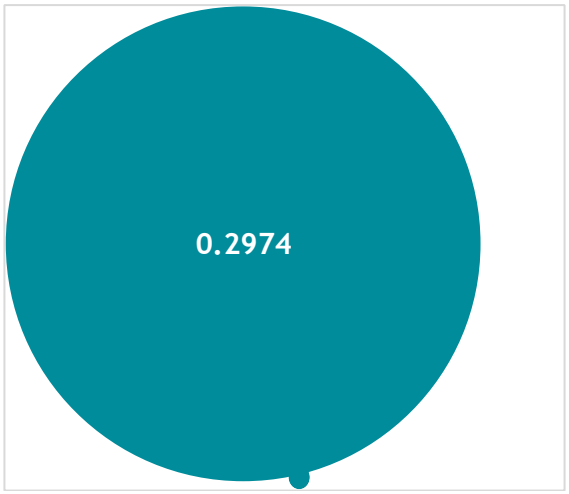
After taking into account those that will acquire digital skills between 2016 and 2025 without intervention, it is estimated that a total of **7.9 million people will require digital skills training,** representing 15% of the UK adult population in 2025. Distributing this population

[25] Ipsos MORI, 2015, Ipsos MORI / Go ON UK Basic Digital Skills UK Report 2015.

[26] The equivalent figure for 2015 is 12.8 million of the UK adult population.

over the ten year period, it is estimated that approximately **788,000 people** will require digital skills training annually.

Figure 11: Projected number of persons that will require basic skills training, 2015 to 2025, by age group, millions



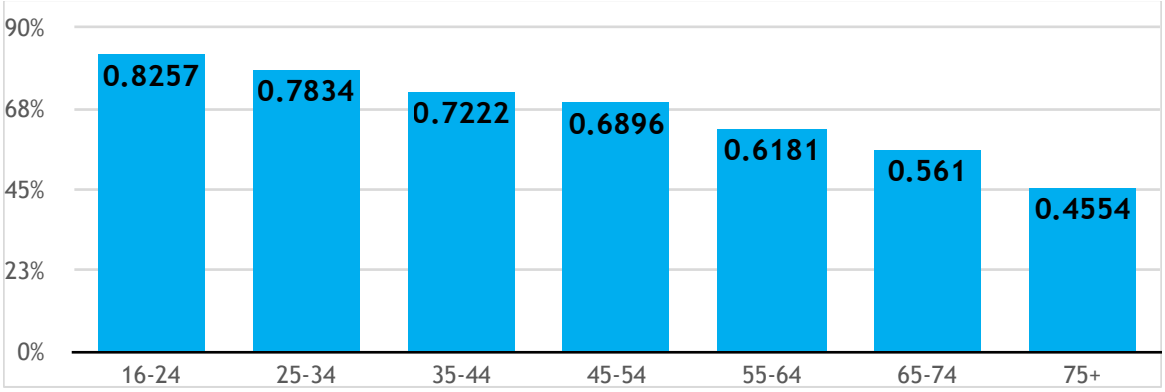
Source: ONS 2012-based sub-national population estimates, Cebr projections

An important element of estimating the overall investment requirement for achieving 100% digital skills is to understand the number of disabled adults that will require digital skills training. According to the Equality Act 2010, a person is defined as disabled if they have a physical or mental impairment that has a 'substantial' and 'long-term' negative effect on their ability to do normal daily activities. This does not of course always preclude those individuals from enjoying the monetary and social benefits associated with Basic Digital Skills.

However, based on the practical experience of digital skills training at UK online centres, disabled individuals tend to require a longer duration of tuition and closer supervision. This increases the cost of training per learner. It is important therefore to be able to separately estimate the number of disabled and non-disabled persons that will require training.

Using data from ONS Internet Users 2015 (which reports internet use by disability status), it was estimated that a total of 4.4 million equality-act disabled persons would require training over the ten year period. Disabled persons are more heavily concentrated in younger age groups – 83% of 16 to 24 year olds requiring training are disabled compared to 46% in the 75+ age group (see Figure 12).

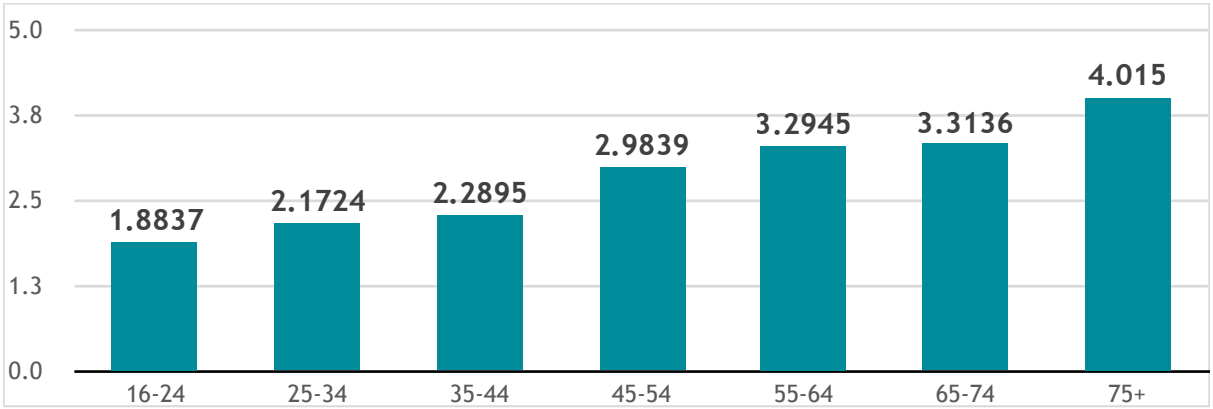
Figure 12: Proportion of persons without Basic Digital Skills classified as equality-act disabled, 2015, by age group



Source: Go ON UK / Ipsos MORI Basic Digital Skills UK Report 2015, ONS Internet Users 2015, Cebr estimates

There exists a substantial variation across age groups in terms of the number of basic digital skills that need to be acquired for them to be classified as having Basic Digital Skills. Results from the Ipsos MORI / Go ON UK digital skills survey shows that, for those without at least one digital skill, people in older age groups require the highest amount of training (see Figure 13).

Figure 13: Average number of Basic Digital Skills required, by age group (no. of skills)



Source: Go ON UK / Ipsos MORI Basic Digital Skills UK Report 2015, Cebr calculations

People without Basic Digital Skills are also more likely to be economically inactive or unemployed compared to the general population. Data from the Ipsos MORI / Go ON UK digital skills survey show that 70% of individuals (age 15+) without Basic Digital Skills are economically inactive compared to 43% for the whole sample. The unemployment rate amongst individuals with digital skills is 23% compared to 13% in the whole sample. A breakdown of the annual number of individuals requiring digital skills training by disability status, activity status and age group is provided in Table 2.

Table 2: Breakdown of the estimated number of individuals requiring Basic Digital Skills training per year, by disability status, age group and economic activity status (thousands of people)

	Non-disabled			Disabled			
	Employed	Unemployed	Inactive	Employed	Unemployed	Inactive	Total
16-24	1.3	0.4	3.4	4.0	3.4	17.2	29.7
25-34	2.9	0.3	4.3	6.6	1.9	18.5	34.5
35-44	4.1	0.3	5.6	6.7	1.5	17.7	35.9
45-54	9.1	0.5	11.8	11.7	2.2	33.7	68.9
55-64	12.9	0.8	24.8	10.7	1.5	50.1	100.8
65-74	7.6	0.3	54.8	4.2	0.3	75.6	142.8
75+	8.4	0.4	195.5	2.4	0.0	168.4	375.1
Total	**46.3**	**3.0**	**300.2**	**46.3**	**10.8**	**381.2**	**787.7**

Source: Ipsos MORI / Go ON UK Digital Skills UK Report 2015, ONS 2012-based sub-national population estimates, Cebr calculations

3.2. What are the costs involved in providing digital skills training?

As mentioned in Section 1.3, one of the objectives of this study is to establish what it would cost to train 100% of the population to a minimum standard of digital skills.

Previous research[27] by Catherine McDonald estimated that such an investment would amount to £875 million over the period 2015 to 2020. This is based around a central average cost of £47 per person across all groups, with variation in costs applied according to employment status, disability status and social grade. The McDonald study used a proxy (internet use) to vary the cost of training per person according to these characteristics.

The approach taken by Cebr in this study is somewhat different. This study uses the survey data from Ipsos MORI / Go ON UK on the distribution of digital skills across age groups to establish the intensity of training required by age group, thereby varying the cost of training an individual by age group and disability.

A further difference is the detail around the operational and capital cost of training attributable to each learner. Through Tinder Foundation, information has been collected from seven digital skills centres on the practical and attributable costs of setting up and operating a basic skills training centre.

The estimated overall investment required also differs from the McDonald study due to the estimates on the number of persons that will require training. The Ipsos MORI GoOnUK survey provides the most comprehensive picture yet on the number of persons in the UK without digital skills. The survey shows that the number of persons without digital skills is higher than previously estimated. As a result the estimated number of persons that will require persons is also higher relative to the McDonald study, which increases the size of the necessary investment.

Overview of the practical costs of training

Based on information provided by digital skills centres, the average cost of training a learner varies substantially and is dependent on the type of learner that attends a centre. For example, centres that deal predominantly with persons who require one-to-one support have higher staff costs, which substantially increases the average cost per learner. In contrast, centres that predominantly serve learners who require minimal one-to-one supervision and tuition have lower operational costs.

Digital skills centres are often co-located in existing community facilities, for example, in libraries and community centres. This allows for the sharing of the operational costs of the centre with other activities that normally have other funding streams. Normal operational costs reported by digital skills centres include property rental, utilities, telephone/ internet, insurance, printing costs, volunteer costs and staff salaries.

Digital skills centres also provided detailed information around the capital cost necessary to set up and run a centre. Typical capital items associated with the setup and continual operation of the centre include flooring, furniture, stationery, IT equipment and signage.

By applying a straight line depreciation formula to the assets, it was possible to calculate an annualised value of the capital investment involved. The annual capital costs were compared with the number of learners that attend courses at the centre each year. These calculations indicate that capital costs per user represent between 2% and 10% of the overall costs of tuition.

Using these estimates, and information on the annual capital and operational costs of digital skills centres relative to the number of annual registered learners, it is estimated that the **overall cost per learner ranges from £45 to £334**.

[27] Catherine McDonald, 2014, 'A Leading Digital Nation by 2020: Calculating the cost of delivering online skills for all', Tinder Foundation.

Variation in the cost of training

The cost of training depends on the specific attributes of learners. As part of the modelling process, Cebr has taken into account the effect of the following attributes when estimating the average cost of tuition per learner:

- **Disability status** - Equality Act disability status incorporates people with both mental and physical impairments which limit the ability of persons to complete daily tasks. This means that some people classified as being disabled may take longer to acquire Basic Digital Skills relative to others which increases the requirement for one-to-one tutors and therefore the cost of provision.
- **The level of existing digital skills training** - People who have never had formal or informal digital skills training will take more time to acquire each skill relative to those who have already had some digital skills training. This increases the cost of tuition per user.
- **Age of the learner** - Survey evidence shows that a higher proportion of older age groups have no digital skills, relative to younger age groups. This means that on balance, it will take the average person in older age groups more time to acquire a Basic Digital skill relative to a younger person.

In Table 3, we provide a summary of the estimated cost per learner, incorporating the variations in costs related to the age of learner, existing skill level and disability status:

Table 3: Average operating and capital cost per learner, by age group and disability status

	Non-disabled		Disabled	
	Operating cost per learner	Capital cost per learner	Operating cost per learner	Capital cost per learner
16-24	£43	£1	£160	£5
25-34	£49	£2	£184	£6
35-44	£52	£2	£194	£6
45-54	£68	£2	£253	£8
55-64	£75	£2	£279	£9
65-74	£75	£2	£281	£9
75+	£91	£3	£340	£11
Average	**£78**	**£3**	**£294**	**£10**

Source: Ipsos MORI / Go ON UK Digital Skills UK Report 2015, Digital skill centres' own estimates, Cebr calculations

Investment required to achieve 100% of population with digital skills

Based on the estimates of the average cost per learner, and number of learners by age group, and disability status presented in Table 2 and Table 3, Cebr estimates that an **investment of £158 million is required each year over a ten year period (2016 to 2025)** in order to equip 100% of the population with Basic Digital Skills. The investment cost is the sum of the capital and operating costs that are required for such an investment to achieve Basic Digital Skills for 100% of the adult population. **The present value of such an investment is £1.31 billion (2014 prices)[28].**

Table 4: Summary of annual operating and capital costs, 2014 prices

[28] Using a discount rate of 3.5%, from the Treasury's Green Book.

	No. of non-disabled (thousands)	No. of disabled (thousands)	Total operating cost (£m)	Total capital cost (£m)	Total investment cost (£m) = operating + capital costs
16-24	5	25	£4m	£0m	£4m
25-34	7	27	£5m	£0m	£6m
35-44	10	26	£6m	£0m	£6m
45-54	21	48	£13m	£0m	£14m
55-64	38	62	£20m	£1m	£21m
65-74	63	80	£27m	£1m	£28m
75+	204	171	£77m	£3m	£79m
Total	**349**	**438**	**£153m**	**£5m**	**£158m**

Source: Digital skill centres' own estimates, Cebr calculations

Cost to learners from purchasing personal digital devices

Crucial to realising the benefits associated with digital skills is for learners to have access to internet-enabled digital devices such as laptop computers, tablets and smartphones. Smartphones are low cost, and an easy way to access the internet, thereby facilitating individuals to benefit from Basic Digital Skills. We therefore focus on smartphone ownership as the minimum criterion for being able to reap the benefits of digital skills.

Calculations based on survey data from Ipsos MORI / Go ON UK shows that amongst people lacking digital skills, on average only 46% of their respective households own at least one smartphone, although this varies substantially depending on the age of the respondent and household composition. This means that in order for the benefits associated with 100% of population with digital skills to be realised, in many cases learners will need to purchase their own digital devices.

Using survey data from Ipsos MORI / Go ON UK and data from ONS internet access 2015, we have projected the likely trajectory of the smartphone ownership rates among households where a member lacks digital skills. Overall, the number of learners each year that will need to purchase digital devices will fall from 54% in 2016 to 17% in 2025, as smartphone penetration amongst the population continues to rise, and the proportion of households with internet access approaches 100%.

In order to calculate the overall cost of purchasing digital devices over the period, we use data on the average smartphone price and project how these prices might change over time. Based on data from IDC, the average smartphone price in 2014 was £207, a drop of 6.3% relative to the year previously. Assuming that average smartphone prices will continue to fall at the same rate over time, we estimate that the user costs of purchasing personal devices will decline from £77 million in 2016 to £14 million by 2025 (2014 prices).

Summary of the training and learner-specific costs

Training an estimated 788,000 number of people each year with Basic Digital Skills will require a substantial financial commitment. We have carried out an analysis to calculate the likely

size of this investment over the ten year appraisal period. We have also estimated the likely cost to learners from purchasing new digital devices in order to utilise their newly acquired digital skills.

We estimate that the cost per learner range from £44 to £351 depending on the age of the learner, their disability status, and previous Basic Digital Skills training. Using these calculations and the projected number of persons that will require training each year, we estimate that an annual investment of £158 million is required. Over a ten year period (2016 to 2025) this investment is estimated to have a present value of £1.31 billion (2014 prices).

In order for learners to be able to fully utilise their newly acquired skills, they will require access to an internet enabled device which may involve the purchase of a smartphone, tablet or laptop computer. Based on the likely trajectory of the price of smartphones and the projected smartphone ownership rate in households where individuals lack digital skills, we estimate that the costs to individuals from purchasing internet enabled devices has a present value of approximately £336 million over the ten year period.

Combining these estimates of training costs and the costs of purchasing digital devices, we estimate that the present value of the required investment equates to £1.65 billion (2014 prices) over the ten year period.

4. The economic benefits of Basic Digital Skills to the UK economy

This section presents the results of our findings on the benefits to individuals and the economy from achieving 100% of the population with Basic Digital Skills. More specifically, we examine the five most likely channels through which the economy and society is expected to gain: time savings to the individuals, increased individual earnings, enhanced employability, online transaction benefits, improved connectivity, and the supply of more efficient government services.

4.1. Time-savings

Individuals with Basic Digital Skills benefit from technology by being able to reduce the time taken to complete routine tasks. More specifically, the ability to use the internet to complete tasks such as financial and government transactions, manage bank accounts and search for government services information can generate significant time-saving benefits. Although a number of banking transactions can only be undertaken within branches, an increasing number of functions and services are now available online. Transferring money between accounts, making payments and applying for a credit card are all possible to undertake online. This is reflected in the growing shift towards online banking, with 56% of the British population in 2015 reporting they regularly use the internet for bank services[29].

Where individuals would typically have had to travel to a bank branch, queue and complete in-person transactions, online banking services enable people to reduce the time they spend completing these tasks. However, the use of online banking services require individuals to have Basic Digital Skills, and thus those without these skills are excluded from the time-savings that accrue to online banking users.

Similar to online banking, online government services also present significant potential time savings to individuals. Growth in the number of people in Britain using the internet for government services has been substantial. By 2013 almost two- thirds (65%) of the population had accessed government information and service delivery applications through the internet, rising from 39% in 2005[30]. Where buying parking permits or paying local council charges would typically require a journey to the local council office or waiting in a telephone queue, accessing government information online can save time and money. However, doing so requires Basic Digital Skills.

The waiting-time and transport-time savings that accrue to individuals from using online banking and government services provide people with extra time, money and freedom to undertake other leisure activities. On average, individuals conduct approximately 54 government transactions online per year[31], and hence save themselves 30 minutes on each transaction, relative to if conducted online relative to conducting those transactions in person[32]. Consequently, individuals are able to save an average of 27 hours per year, from undertaking government transactions online. Further, on average, we estimate that individuals can save 33 hours per year through undertaking banking transactions online[33]. However, these savings only accrue to individuals who have the ability to conduct financial and government transactions online - in other words, to people with Basic Digital Skills.

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[29] ONS, 2015, 'Internet Access - Households and Individuals, 2015'.

[30] Dutton, W., Blank, G., and Groselj, D. (2013), "Cultures of the Internet: The Internet in Britain", Oxford Internet Survey 2013 Report

[31] Government Digital Service blog: https://gds.blog.gov.uk/2011/05/10/digital-by-default/

[32] Security Identity Alliance, "eGovernment services would yield up to $50bn annual savings for Governments globally by 2020", (2013): https://www.secureidentityalliance.org/files/13-11-19-SIA_eGov_Study.pdf

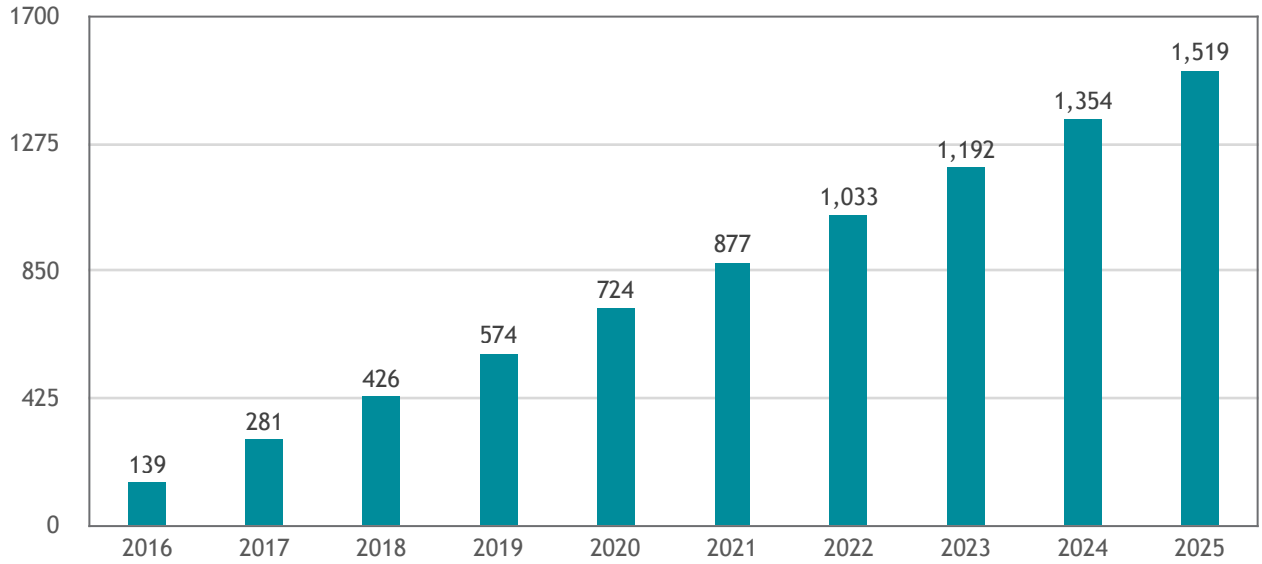
[33] Just Economics for BT,(2014)," Valuing Digital Inclusion: Calculating the social value to individuals of going online",

Once an individual is trained and has attained Basic Digital Skills, we assume that half of all financial and government transactions would be undertaken online by the individual. This saves an individual who has recently attained Basic Digital Skills 30 hours in leisure time per year from undertaking government and banking transactions online rather than in person or on the phone. Figure 14 illustrates the value of leisure time saved from undertaking banking transactions and accessing government services online, through the use of Basic Digital Skills.

We use the Department for Transport's (DfT) estimates of the value of leisure time[34] to identify the monetary value of these time savings. We use leisure time valuations as often individuals undertake such transactions during their personal time and whilst away from work. DfT's valuations reflect the monetary value individuals place on their leisure time. By 2025, we estimate a total of 236 million hours could be saved by the 7.9 million people who will receive basic skills training.

This is valued at £1.5 billion per year by 2025 based on DfT's monetary estimates of the value of leisure time. To the extent that the performance of these tasks involved eating into work time that could not or was not made up by the employee, the appropriate monetary valuation of the time lost would be higher. The £1.5 billion is not a realisable financial gain, but does constitute a welfare gain, allowing individuals to use more of their leisure time for more enjoyable pursuits.

Figure 14: Cumulative value of time saved from undertaking government and banking transactions online, through the use of Basic Digital Skills, 2016-2025 (£ millions)



Source: Security Identity Alliance, Just Economics, Government Digital Service, BT Report, DfT WebTAG 2014, Cebr analysis

4.2. Earnings

Basic Digital Skills are required to complete a range of tasks in the workplace, such as using email to communicate with customers and colleagues, using social media to promote products and services, and for conducting transactions with and payments to customers and suppliers. Equipping individuals in the workplace with Basic Digital Skills provides people with the capacity to be more productive. As individuals with Basic Digital Skills are equipped with the IT skills and knowledge to move into higher skilled positions, achieve more, and contribute to the success of their business, they are rewarded with higher salaries.

These individual earnings' benefits flow into the wider economy, through two main channels:

[34] Similar to the way our hourly wage represents the value of our working time, the DfT's leisure time valuation attaches a monetary value to our leisure time, i.e. the time we spend outside of work.

- **Individuals:** Firstly, individuals who acquire Basic Digital Skills benefit from an increase in earnings and, hence incomes. Additional household spending drives the purchase of goods and services in the wider economy, which have knock-on effects on the business economy.

- **Government:** Following from the boost to earnings that accrue to individuals with Basic Digital Skills, governments benefit from increased employer and employee National Income Contributions (NICs) and income tax benefits.

The Centre for Education and Economics estimated an average ICT wage premium of between 3% and 10%[35], although evidence from the European Commission has suggested the wage premium could be as high as 20%[36]. The most conservative and robust estimates indicate that the digital skills wage premium is 2.8%. This implies that, through attaining Basic Digital Skills, individuals could expect a lifetime increase in average hourly earnings of 2.8%.

Based on the available evidence, people without Basic Digital Skills tend to have below average earnings. For this reason, we apply this wage premium to the lowest quartile of employees' earnings in the UK[37]. We estimate that, if the estimated number of people required to achieve a 100% population with Basic Digital Skills are trained every year (of which 93,000 are employed people) then, by 2025, Basic Digital Skills could facilitate a boost in absolute net earnings across the economy by £358 million[38] per year[39] by 2025 (see Figure 15). This is equivalent to an average net earnings increase of £376 per person trained per year from attainting Basic Digital Skills.

The realisation of these gains is likely to be contingent on employers observing productivity improvements amongst those acquiring Basic Digital skills. The benefits of the improvement in the contribution of the individual, in value added terms, then needs to be shared with them by employers through higher wages and salaries. In this sense, the £358 million is a lower bound estimate of the productivity boost in value added terms.

Added to the £358 million estimated boost to net earnings is the additional tax contributions that make up the remainder of the gross boost to wages and salaries - income tax, employees' and employers' NICs[40]. By 2025, we predict the government to benefit from at least an additional £243 million in additional tax receipts per year.

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[35] Centre for the Economics of Education (2007), "The Impact of Computer Use, Computer Skills and Computer Use Intensity:
Evidence from WERS 2004"

[36] Haisken-DeNew, P. (2007), "e-Living D11.3 - ICT and Socio-Economic Exclusion Final Report: 'eLiving' Waves 1 and 2, 17
November 2007"

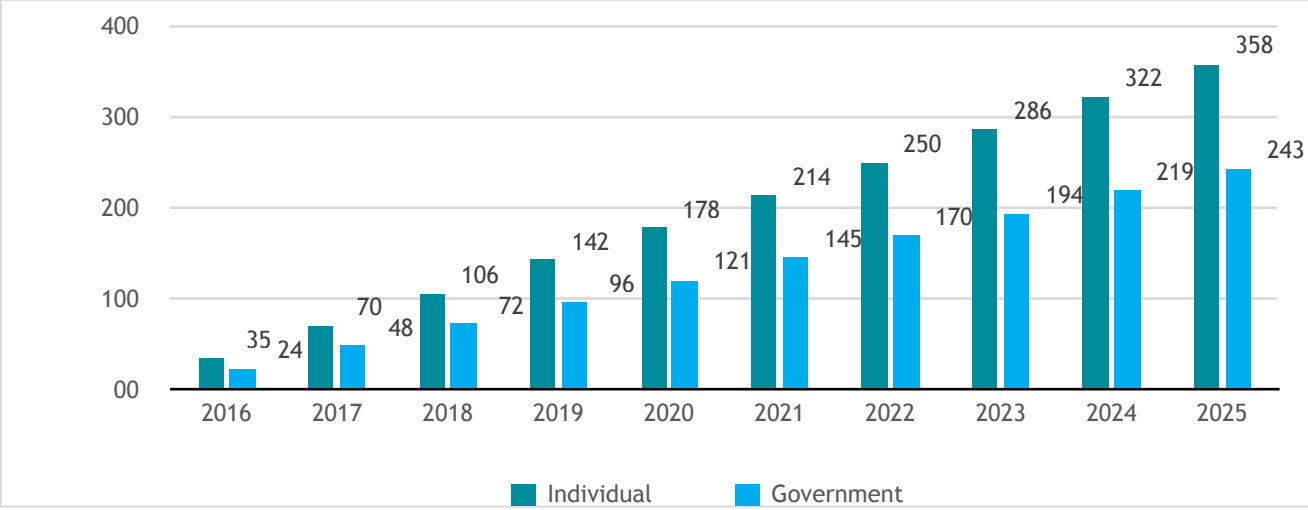
[37] This is for the purpose of ensuring our estimates remain conservative.

[38] This figure refers to net earnings. It captures the difference between the earnings that would accrue to individuals with Basic digital skills, relative to the earnings they receive without Basic digital skills.

[39] We assume that the returns to Basic digital skills stay fixed over time.

[40] We acknowledge that individuals from the lower earnings quartile could still be earning working tax credits and/or child tax credits from the government, despite realising a rise in salary. This has not been accounted for in our model.

Figure 15: Cumulative absolute net earnings benefits to individuals, and to the government through the use of Basic Digital Skills, 2016-2025 (£ millions)



Source: Centre for Education and Economics, ONS, Cebr analysis

4.3. Employability

In addition to benefitting people who are already working (see Section 4.2), the use of Basic Digital Skills can also help those who are out of work to find suitable employment.

The internet has transformed the way people hunt for jobs, acting as an intermediary connecting employers and jobseekers. From company websites to online job boards, and from recruitment agencies to information and advice forums, the internet has made the search for a new job quicker and more efficient. By posting vacancies online, employers can access vastly more potential applicants than they would from posting the job openings on, for example, a noticeboard. Likewise, jobseekers can search for a greater number of job opportunities at one time, making their online search more economical and effective than traditional methods.

Further, the quality of matching employers' requirements to the skills and demands of jobseekers is improved, as they are connected more efficiently through the ability to screen and filter vacancies and applicants through various tools online. We estimated 137,000 unemployed people are currently being excluded from access to relevant job opportunities and the chance to enter employment faster because they lack digital skills. Without action, this exclusion is likely to grow over time, with many companies increasingly only accepting online applications, through websites or via email.

In the past, empirical evidence illustrating a positive association between ICT skills and employment has been mixed. However, alongside the growth of the use of the internet across the economy, more recent research has identified a positive relationship between the internet, and hence Basic Digital Skills, and employment.

Kuhn and Mansour (2011) revealed that internet job-searching reduces the duration that an individual might be unemployed for by 25%[41]. This is in contrast to Kuhn and Skuterud (2004)'s initial finding that internet job-searches were associated with longer unemployment durations during the period 1998 to 2000[41]. This reversal in findings illustrates the increasingly positive role the internet has on reducing unemployment.

Further, Stevenson (2008) found that if internet penetration in a community rose by 10%, the probability that someone unemployed would send out a CV increased by 2%, while the likelihood of a person contacting a private recruitment agency rose by 10%[42]. PWC

[41] Kuhn, P. and Mansour, H. (2011) "Is the Internet job search still ineffective?"

[42] Stevenson, B. (2008) "The internet and job search", NBER

incorporates existing literature to identify that between 3.5% and 7.5% of unemployed people would be helped into employment if they obtained digital skills[43]. We use a mid-point of 5.5%, and apply this probability to the lowest earnings quartile, to estimate the increase in earnings across the economy from 5.5% of people out of work becoming employed after acquiring Basic Digital Skills. The results of our estimation are presented in Figure 16 below. These benefits are contingent upon there being sufficient demand for additional labour. However, this is more likely given the aforementioned productivity improvements. As well as sharing the benefits with existing employees through higher wages and salaries, as outlined in the previous subsection, the productivity improvements can also stimulate investment, which usually leads to job creation.

Basic Digital Skills further benefit the unemployed by increasing the likelihood of the economically inactive re-entering the labour force. People out of the workforce (known as economically inactive) are often so due to health or mobility issues, or caring responsibilities. [43] However, flexible working arrangements, and remote working technologies can enable people to balance their personal commitments and responsibilities with the demands of working life, and their use can thus encourage people out of the workforce to enter it.

In 2014, 14% of all employed people reported working from home, representing a rise of 15% in the level of home-workers compared to 2010[44]. This trend has been fostered by the growth in the use of the internet, the cloud and other remote working technologies. But such flexible working arrangements involve the use of digital technologies and hence require the employee to hold Basic Digital Skills. To the extent that these skills, or the lack thereof, are a barrier to re-entering the workforce due to the inability to work remotely, the acquisition of these skills by more people is likely to encourage more economically inactive to re-enter the workforce because remote working is made possible.

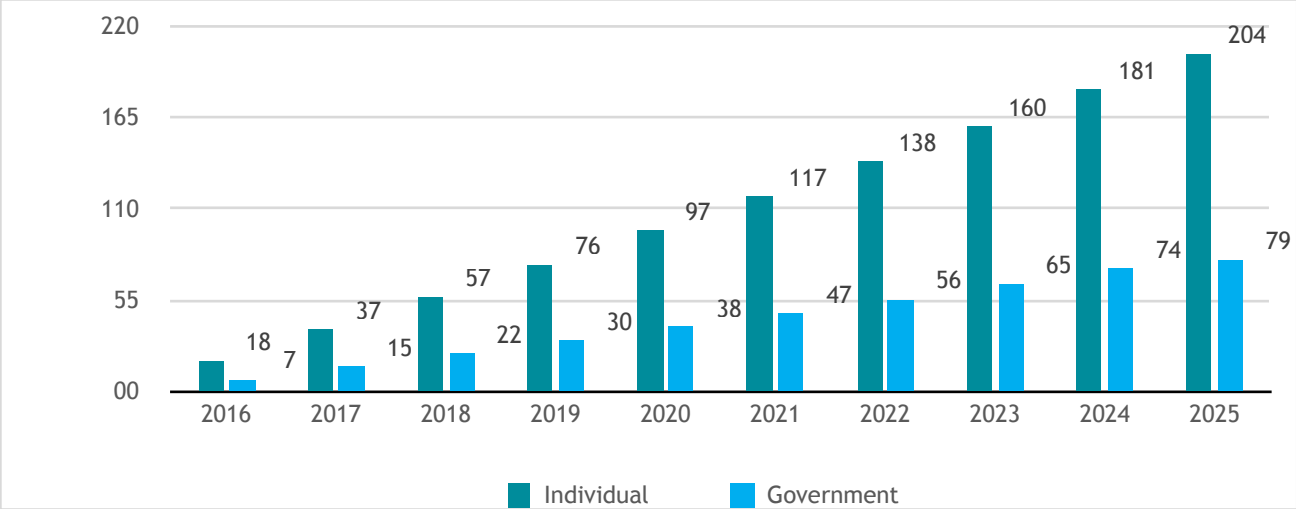
Of the economically inactive population in the UK, we estimate that 681,000 would need to be equipped with Basic Digital Skills each year before they have adequate levels of digital skills to work remotely. Once they are trained in basic digital literacy, Cebr's work for Citrix suggests that, given the ability to work remotely, over a fifth (21%) of people who are currently economically inactive would be more inclined to start looking for a job[45]. We apply this proportion to those trained in Basic Digital Skills. Furthermore, we assume 5.5% of those who would be more inclined to look for employment, will find a job as a result[43]. We then apply the probability that economically inactive people will enter the workforce (5.5%) to the lowest earnings quartile of the economy. This identifies the increase to earnings across the economy as a result of equipping the economically inactive with Basic Digital Skills, which can encourage them to enter the workforce. The results of our estimation are presented in Figure 16.

[43] PWC, (2009) "Champion for Digital Inclusion: the economic case for digital inclusion"

[44] ONS Characteristics of Home Workers, 2014

[45] Cebr, (2014), "The productivity value of the untapped workforce: a study into the potential economic impact of a flexible working culture: a report for Citrix."

Figure 16: Cumulative employability benefits to individuals, and to the government through the acquisition of Basic Digital Skills, 2016-2025 (£ millions)



Source: PWC, Citrix, ONS, Cebr analysis

Similar to the earnings benefit described in Section 4.2, increased employment signifies a boost to earnings to both individuals and the Government. As the number of people employed rises, the Government benefits from increased income tax receipts, and employer and employee NICs. Further, as unemployment declines, we expect the Government to benefit from paying fewer people Jobseekers' Allowance (JSA)[46].

Overall, we estimate that by 2025 the total employability benefits to both government and individuals will amount to £283 million. Of this total benefit, we estimate the economy to gain from a £204 million boost to individuals' earnings, and a £79 million increase in Government tax receipts and reduction in transfers, by 2025.

4.4. Retail transaction benefits

Basic Digital Skills equip individuals with the capacity to take advantage of transaction benefits, which accrue through the financial and other savings made from online purchases.

The internet has revolutionised the way people shop. Being able to use search engines and price comparison sites on the internet can increase the speed with which buyers are connected with sellers. Instead of physically travelling to shops on the high-street and searching between stores, users of the internet can simultaneously search across brands, between categories and within price brackets, generating significant time savings. At the same time, the internet allows companies to sell their products and services in a digital store without being limited to shelf space. Consumers are provided access to a vast variety of sellers, ranging from global brands to niche retailers[43]. The extensive range of products and services on offer through the internet has resulted in fierce competition, which has led to lower prices, often displayed through online discounts and offers.

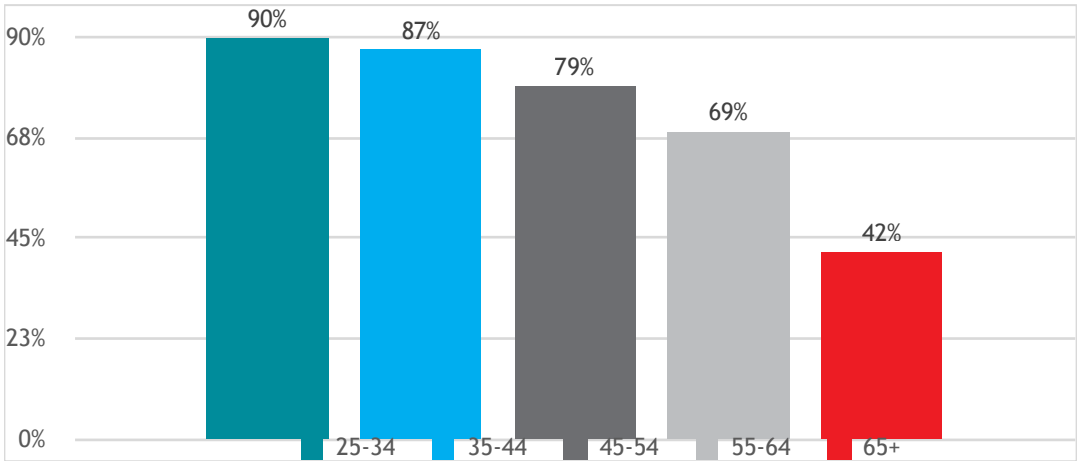
Households can benefit in a number of ways through online shopping, with savings made in categories such as insurance and mortgage payments, holidays, electronics and clothing, where the internet has facilitated the search for the best available deals on products. Using this finding, PWC estimate that approximately £4.5 billion of savings per year are lost by digitally excluded households, who cannot benefit from savings made from online transactions[47].

[46] We only account for a reduction in JSA claims (assuming an average of £69.33 per week). We do not account for other government transfers such as the Disability Living Allowance and child tax credits, which may be affected by an increase in employment.

[47] PWC, (2009) "Champion for Digital Inclusion: the economic case for digital inclusion"

Those in older age groups without Basic Digital Skills are the most likely to be losing out from these potential transaction benefits. As Figure 17 illustrates, the proportion of people shopping online is concentrated in the younger age brackets, suggesting that they already have Basic Digital Skills and are thus more likely to be benefitting from transaction benefits. By comparison, only 42% of people aged over 65 used the internet to make purchases.

Figure 17: Proportion of individuals shopping online, by age group, 2015



Source: ONS, Cebr analysis

To estimate the transaction benefits that could be generated if more people had Basic Digital Skills, we focus on the savings that consumers experience from buying items online. Using the E- Commerce in Europe in 2014 survey, we identify the average value spent online by the UK consumer as £957 per year[48]. PWC finds that, on average, consumers save 13% by shopping online. Using this finding, we estimate that the average internet shopper in the UK saves £143 per year on average by taking advantage of online offers and discounts[49]. We apply the variation in savings by age-group observed using the Family Expenditure Survey to account for the likelihood that younger people spend more online, and therefore save more, relative to those in older age groups[50].

Applying these figure to the number of people that need to be trained to achieve a 100% population with Basic Digital Skills, we estimate that transaction benefits would amount to £796 million by 2025. Figure 18 breaks this down by age.

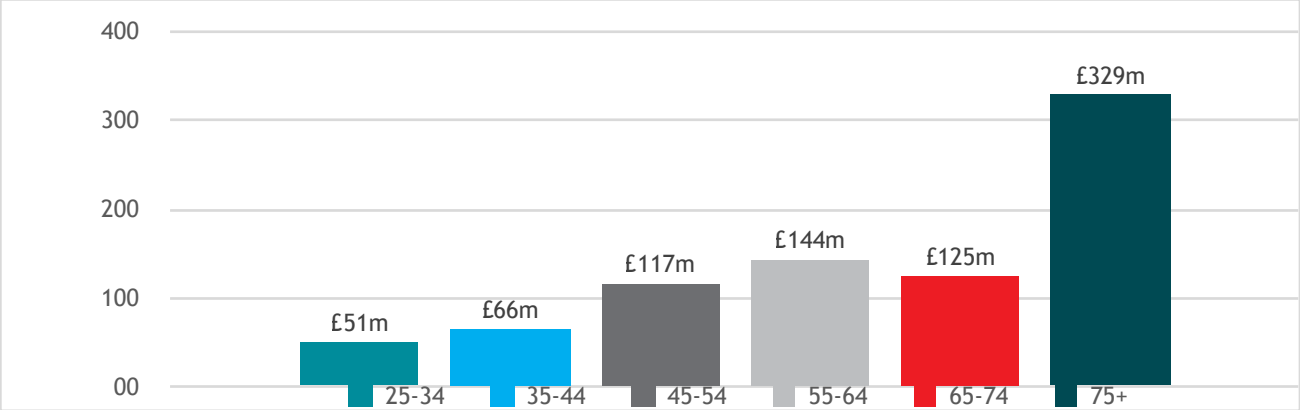
In line with the greater proportion of older people without Basic Digital Skills, we expect those aged over 75 years to gain significantly more than other age groups, saving £329 million by 2025. By comparison, equipping 25-34 year olds with Basic Digital Skills are expected to lead to a total transaction benefit of £51 million by 2025. These benefits constitute a welfare improvement, allowing consumers to extract greater consumers' surplus relative to shopping through traditional means.

[48] Postnord (2014), "E- commerce in Europe 2014"

[49] We assume that the average spend and saving online remains the same over time.

[50] We achieve this by applying the same age variation in household spending to online spending, using data from the ONS Family Expenditure Survey 2014.

Figure 18: Cumulative transaction benefits arising from providing Basic Digital Skills, by age-group, 2015 - 2025, £ millions



Source: E-Commerce in Europe 2014, Economic benefits of digital inclusion, ONS Family Expenditure Survey 2014, Cebr analysis

4.5. Communication benefits

Digital skills provide individuals with a range of methods of staying in touch with family, friends and the local community. Sending emails, video conferencing, sharing photographs and social media are all overtaking more traditional methods of staying in touch with people. However the benefits of these technologies are excluded to people lacking Basic Digital Skills.

Social exclusion, or isolation has long been known as a determinant of mental health and wellbeing, and has been linked to unhappiness, illness and a shortened life-span[51]. Connecting people with others ensures that individuals feel valued and respected, and provides them with the emotional support and companionship that can help avoid or reduce stress, anxiety and depression[51]. Social isolation is particularly prevalent among older age groups, who are more likely to be marginalised due to lack of digital literacy.

Research by FreshMinds for UK online centres found that 49% of people who had not used the internet felt they were a part of their local community[52]. Once the group had used the internet, the proportion of people feeling close to their community grew by 11 percentage points. Similarly, 64% of non-internet users reported feeling in touch with their family. This proportion grew to 78%, once the sample had used the internet. This indicates that acquiring Basic Digital Skills can provide tangible social benefits to individuals in the form of improved connectedness with the community, family and friends.

Such benefits would be expected to felt through improvements in Quality-Adjusted Life Years (QALYs) and through improvements in well-being. These are more difficult to monetise and is beyond the scope of this research.

However, increased social inclusion can encourage people to take part in recreational activities, therefore boosting the leisure sector of the economy. For example, a person who is socially included is more likely to spend their evening at a local pub with their friends, or to visit museums with their family. On average in the UK, an individual spends £27 per week on cultural and recreational activities[53]. We use the variation in spending between age groups to estimate the weekly spend on cultural and recreational activities across different age bands.

Using the findings from the FreshMinds study, we identify the proportion of people reporting feeling connected to their local community, friends, and family *after* using the internet is on

[51] VicHealth, 2005, "Social Inclusion as a determinant of mental health and wellbeing".

[52] FreshMinds for UK Online Centres,(2009) "Does the internet improve lives"

[53] ONS Family Expenditure Survey 2014

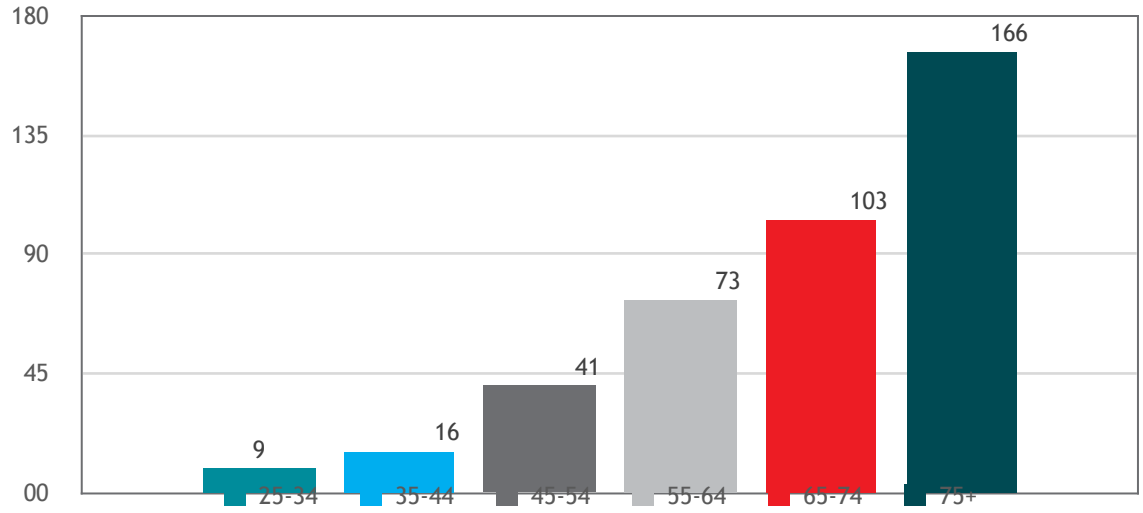
average, 14 percentage points higher than the proportion that indicate feeling connected *before* using the internet[52]. Following this, we assume that once trained with Basic Digital Skills, the proportion of people willing to spend more on recreational activities will rise by this proportion.

As a result of increased communication fostering greater connectedness, we anticipate that these individuals will spend more on recreation and cultural activities with their family, friends and the community. Some of this additional demand may be contingent on the aforementioned earnings and employability benefits being realised, but most should be a result of individuals spending existing disposable income that was not being used because they were not connected to their community via Basic Digital Skills.

We take a conservative estimate and assume that those individuals that feel more connected, as a result of internet communication, spend 25% more on recreational and cultural activities. This implies that the average weekly spend on such activities would increase by £6.75[54]. Some individuals could spend more than this due to being more connected, likewise, others could spend less than this amount. This figure suggests that, once equipped with Basic Digital Skills, individuals will be willing to spend an extra £6.75 per week of their disposable income on recreational activities across the economy as a result of feeling more connected through with their local community, friends and family.

Overall, we estimate the aggregate additional expenditure on recreational and cultural activities to amount to £415 million by 2025. Figure 19 presents the 10 year cumulative communication benefits that accrue as a result of individuals becoming more connected and socially included through the use of Basic Digital Skills, disaggregated by age group. We estimate people in the 75+ age bracket to be the greatest beneficiary in terms of Basic Digital Skills and hence communication benefits – equating to £166 million by 2025.

Figure 19: Cumulative implied value of communication benefits arising from providing Basic Digital Skills, by age, 2016-2025, £ millions



Source: Source: ONS Family expenditure survey 2014, FreshMinds Online UK Centres 2009 report, Cebr analysis

4.6. Transacting with government: focus on the NHS

In 2012, the Government launched its 'digital by default' initiative, which aims to ensure that government services not online already be made available via the Internet. Currently half of all government services are online, but over 250 million transactions per year remain

[54] Based on average weekly household expenditure on recreation and culture activities (ONS Family Expenditure Survey 2014).

telephone- or paper-based.[55] Moving towards providing more services digitally could save the public sector about £5.1 billion annually, which could be ring-fenced and invested into other national priorities[56]. Further, these savings could be crucial in achieving the Chancellor's objective of reducing the government budget deficit.

Of the £5.1 billion in savings, between £1.7 and £1.8 billion every year is expected to be saved through digitising central government, which is expected to generate efficiencies by reducing staff time involved in processing transactions online, as opposed to offline; estates and accommodation; postage, packaging and materials[55]. In addition, a digital by default Government benefits citizens, by increasing the amount of information that is readily accessible to them. These benefits have not been included in the cost-benefit analysis as the benefits reported in the Digital Efficiency Report would accrue without investment in digital skills and therefore are not additional.

However, under a scenario whereby the Government was to invest in a Basic Digital Skills programme, which is studied in this report, it would bring forward the timing and increase the size of the savings related to the Government's digital efficiency strategy. Therefore support from the Government to invest in a Basic Digital Skills training programme would accelerate the benefits of the Government's digital efficiency strategy.

Around 70% of the total cost saving is expected to be made through digitising the NHS[57]. These savings (totalling £2.9 billion) are expected to be made through NHS introducing more online consultations and appointment booking systems; sending appointments via e-mail; and triaging patients via video consultations[57]. As a result, the NHS aims to reduce waste and encourage patients towards lower cost channels of access to healthcare[57].

One way in which the NHS is moving online is through the launch of the NHS Choices website in 2007. The website aims to help individuals make decisions about their health, by supplying advice on lifestyle issues, such a smoking and drinking, as well as providing medical information and online health tools. By providing information to users of the website, NHS Choices aims to reduce potentially avoidable GP consultations, and thereby achieve significant cost savings by reducing demands on limited GP capacity.

A study by Murray, Majeed, Khan, Lee and Nelson (2011) examined the extent to which the NHS Choices website has reduced the frequency with which people visited their GP for consultations[58]. They find that 29.5% of users surveyed indicated that using NHS Choices reduced the frequency with which they visited their GP. The study goes on to conclude that 29.5% of NHS Choices users would otherwise have made at least one GP appointment, had they had not accessed the website. Similarly, more recent information from the NHS Widening Digital Participation (WDP) programme shows that 34% of those learning Basic Digital Skills said they made fewer visits to a doctor after learning about online health resources, as a result of finding the information they needed online.

Murray et al. (2011) estimate that the savings made to the NHS through reduced GP consultations could total £94 million per year. However, the realisation of this saving is constrained by individuals' ability to access the NHS Choices website, which requires Basic Digital Skills. As people without Basic Digital Skills are unable to use the NHS Choices website, it is reasonable to assume that they are imposing a burden on the NHS, through making avoidable GP visits.

Following the methodology of Murray et al., (2011), we assume that by equipping individuals with Basic Digital Skills, at least one GP appointment per individual could be avoided. With

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[55]Government Digital Service (2012) "Digital Efficiency Report", https://www.gov.uk/government/publications/digital-efficiency-report/digital-efficiency-report

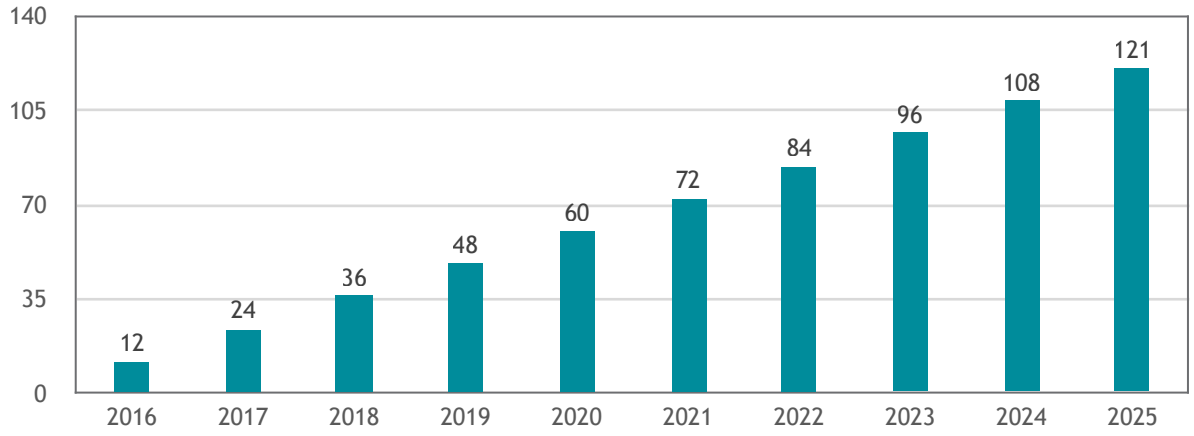
[56] Booz and Company, (2012) "This is for Everyone: the case for universal digitisation"

[57] NHS, "Digital by default: the delivery choice for this generation" (2012)

[58] Murray, J., Majeed, A., Khan, M., Lee, J and Nelson, P. (2011) "Use of the NHS Choices website for primary care consultation's: results from online and general practice surveys"

each GP visit costing the NHS £45[59] and assuming 34% of the 788,000 trained per year by the programme reduce their annual GP visits by one appointment, we estimate that the NHS could save approximately £12 million within one year, as illustrated in Figure 20[60]. This represents over 10% of the total savings that could arise from the NHS Choices website, as suggested by Murray et al. (2011). By 2025, we expect the cumulative savings to the NHS from equipping individuals with Basic Digital Skills and hence encouraging the use of NHS Choices to amount to £121 million.

Figure 20: Cumulative cost savings to NHS from a reduction in GP consultation due to the use of the NHS Choices website, £ millions, 2014-2025



Source: Murray et al. (2011), Academy of Medical Royal Colleges (2014), Cebr analysis

4.7. Aggregate benefits

Table 5 presents the aggregate economic benefits that are estimated to accrue across the economy as a result of equipping 788,000 individuals with Basic Digital Skills each year, until 2025. As more people are trained each year, we expect the benefits to the economy to accumulate. By 2025, we estimate that the annual aggregate economic benefit of equipping people with Basic Digital Skills will total £3.7 billion.

[59] Academy of Medical Royal Colleges, (2014) "Protecting resources, promoting value: a doctor's guide to cutting waste in clinical care".

[60] Murray et al.'s (2011) study is limited to young, healthy users of the NHS Choices website. Older users, or those with pre-existing illnesses are more likely to physically visit their GP for consultations than young, healthy users. As the number people without Basic digital skills is skewed towards those disabled, and in older age groups, our findings are likely to be on the conservative side. Equipping people with Basic digital skills which allows them to use NHS Choices may reduce the number of GP visits by more than the average suggested by the young, non-disabled respondents of Murray et al.'s (2011) study. As a result, the savings to the NHS from achieving a 100% population with Basic digital skills could be even greater than those indicated by our findings.

Table 5: Cumulative aggregate economic benefits, arising from providing Basic Digital Skills, 2016 - 2025 (£'s millions)

	Time savings	Earnings benefit	Employment benefits	Transaction benefits	Communication benefits	NHS Cost savings	Total benefits
2016	139	59	26	80	42	12	**357**
2017	281	118	52	159	83	24	**718**
2018	426	178	79	239	125	36	**1,083**
2019	574	238	107	318	166	48	**1,451**
2020	724	299	135	398	208	60	**1,823**
2021	877	359	164	477	249	72	**2,199**
2022	1,033	420	194	557	291	84	**2,578**
2023	1,192	480	224	637	332	96	**2,962**
2024	1,354	541	255	716	374	108	**3,348**
2025	1,519	602	283	796	415	121	**3,735**

Source: Cebr analysis

Our estimates of the earnings benefit reflect the increase to incomes that can be expected if individuals gain Basic Digital Skills. This boost to earnings translates into additional disposable income, which can be spent on goods and services in the wider economy. Furthermore, the earnings benefit also captures the rise in employer and employee NICs, and income tax receipts that the government gains, from individuals with higher incomes. By 2025, we estimate the total earnings benefit to the economy to equate to £602 million.

Employability benefits also account for the gains to individuals and government. We expect these benefits to accrue through the increased likelihood that unemployed, or economically inactive individuals, will enter work when equipped with Basic Digital Skills. The move into employment will boost individuals' incomes, and as a result, increase employees' and employers' NICs, and income tax receipts to the government. We estimate the total employability benefits to amount to £283 million by 2025.

In contrast to the earnings and employability benefits, we estimate that the transaction benefits only accrue to individuals. Our valuation of the transaction benefits captures the cost savings that can be made by individuals from shopping online, and we estimate these benefits to total £796 million by 2025.

Additionally, Basic Digital Skills enable individuals to communicate with friends, family and the community, thereby feeling more connected. As a result, we estimate the aggregate additional expenditure on recreational and cultural activities to amount to £415 million by 2025.

Our estimation of the time savings benefits accounts for the value of individuals' time saved from undertaking financial and government transactions online, relative to having to physically visit a bank branch, or local council office. Assuming half of these transactions would now be undertaken online, we estimate the value of time saved by 2025 to total £1.5 billion.

Finally our valuation of the benefits to the NHS captures the cost saving associated with a reduction in avoidable GP consultations through the use of the NHS Choices website. We estimate the cost savings to the NHS to total £121 million by 2025.

5. Comparing the costs and benefits of investing in Basic Digital Skills

In this section, we compare the costs and benefits of investing in digital skills to the government and society. We carry out a cost-benefit analysis in order to quantify in monetary terms as many of the costs and benefits of such an investment as it is feasible to, thus providing a basis for assessing whether it is likely to be worthwhile from the perspective of society and Government.

The analysis involves discounting all costs and benefits to present day values and calculating the ratio of those costs and benefits for the appraisal period.

5.1. Methodological approach

In sections 3 and 4, we set out the estimated costs and benefits associated with a scenario in which investment is made to train the 7.9 million people who are estimated to require Basic Digital Skills over the period 2016 and 2025 and that would deliver Basic Digital Skills to 100% of the UK adult population. These costs and benefits represent the difference between the 'do nothing' scenario i.e. the likely outcome if no investment is made, and the 'intervention' scenario – the likely outcome related to the proposed investment.

People generally prefer to receive benefits as early as possible while paying costs as late as possible. Costs and benefits occur at different points in the life of the project so the valuation of costs and benefits must take into account the time at which they occur. In order to determine the present value of the costs and benefits, the values need to be discounted to reflect this time preference. We use a standard discount rate of 3.5%, as stipulated in HM Treasury's Green Book guidance on appraisal and evaluation in central government.[61]

There exist several ways to present a comparison of the costs and benefits of an investment as described in this report:

- **Net Present Value (NPV)** - The NPV is the sum of the discounted cash flows over the period. This criterion is simply based on whether the sum of discounted benefits exceeds the sum of discounted costs. The minimum criterion for a project to proceed is for the NPV to exceed 0. However, it is often the case that projects require a larger margin to take into account unknown risks and uncertainties.
- **Cost Benefit Ratio (CBR)** - The CBR represents the ratio of discounted benefits to discounted costs. A ratio greater than one indicates that the project should go ahead because benefits exceed costs. But other factors, such as the size of investment, funding options, risk, optimism bias, sensitivities to budget overruns and sensitivities to overestimation of benefits should be taken into account. Generally speaking, a large cost benefit ratio would normally indicate that benefits are sufficiently large to exceed costs, even at the limits of sensitivity analysis thresholds.

[61] The Treasury's Green Book sets out the definition and de-construction of the Social Time Preference Rate (STPR). The STPR is the rate used for discounting future benefits and costs in order to trade-off the value society attaches to present, as opposed to future consumption.

5.2. Results of the analysis

After taking into account all the costs and benefits to learners and the Government associated with the proposed investment for the 10 year investment period (2016 to 2025), the Net Present Value is estimated at £14.3 billion (2014 prices) with an overall Cost Benefit Ratio of 9.7. A summary of the costs and benefits are presented in Table 6.[62]

[62] The benefits estimated in Section 4 are cumulative benefits over 10 years, which is equivalent to the figures under the column heading "Year 10" or "2025". The NPV is the sum of the discounted cash flows over the period of the entire investment. This criterion is simply based on whether the sum of discounted benefits exceeds the sum of discounted costs, which are presented under the "Total (present value) column.

6. Conclusions

The findings of this study demonstrate that equipping the whole UK population with at least Basic Digital Skills has the potential to generate substantial social and economic benefits to the economy.

Overall, this study concludes that the benefits of training those without Basic Digital Skills far outweigh the costs involved, and such an investment would generate a substantial return to society and to Government. In fact, the study shows that the boost to tax receipts and NHS savings alone exceed the size of the investment required.

Investing in upskilling the population should be viewed by policymakers as an investment in the UK's future economic prosperity. Our study demonstrates that the government, businesses, and individuals are at risk of losing out substantially if we miss this opportunity to invest in digital inclusion.

For the Government, investing in the nation's digital skills broadens the population that is capable of availing of digital initiatives designed to save the Government money. This means that a strategy to invest in digital skills could generate substantial synergies with other initiatives such as in digitising Government and NHS services and the national broadband delivery programme.

For individuals, having digital skills represents a whole host of potential life-changing benefits including the possibility of finding employment more easily and reducing social exclusion. Such an initiative would therefore have a positive impact not just on the economic performance of the UK, but also on the social wellbeing of the nation.

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